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THE PREHISTORIC MEN OF
KENTUCKY



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COLONEL BENNETT H. YOUNG
Member of The Filson Club

FILSON CLUB PUBLICATIONS No. 25

THE PREHISTORIC MEN OF KENTUCKY

A History of what is known of their Lives and Habits, together with a description of their Implements and other Relics and of the Tumuli which have earned for them the designation of Mound Builders

A Paper

Prepared to commemorate the Silver Anniversary of The Filson Club

BY

COLONEL BENNETT H. YOUNG

Member of The Filson Club

Illustrated



LOUISVILLE, KENTUCKY

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A CONFIDENTIAL FOREWORD

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IN 1890 the author was induced to begin the collection of prehistoric implements. Thomas G. Went, a learned and intelligent antiquarian, who was for many years Chief Assistant in the office of the Superintendent of Public Instruction of Kentucky, at Frankfort, first induced me, by the gift of a small and well-selected cabinet, to enter upon what was to become a delightful and permanent study and pursuit.

When a member of the Constitutional Convention of Kentucky, in September, 1890, a delegate incidentally mentioned to me that Mr. Went had some beautiful arrow-heads, and that they would well repay a visit and investigation. This was done on the following day, and these specimens were found to be marvels of beauty. Few comparatively in number, but which had been selected by a careful, discriminating, and enthusiastic student, they were worthy of all the admiration that could be felt or expressed in their examination.

During the conversation he inquired if his visitor were a member of the Constitutional Convention. Having received an affirmative reply, he remarked that there was one member of the Convention from Louisville he was extremely anxious to meet—Bennett H. Young. The response came that the visitor knew the gentleman well and had a great affection as well as regard for him, and would be glad to bring him over on the day following,

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and twelve o'clock was fixed as the time for the call of this Louisville visitor. Promptly at the hour the author appeared at Mr. Went's desk. The venerable student raised his eyes when saluted, but a shadow of disappointment passed over his face as he saw the author alone. In response to his inquiry why Young did not come, I waved my hand and smote upon my breast, and with some degree of pleasure and also pride, said, "Mr. Went, I am he!" This naïve and somewhat uncere- monious introduction pleased the reserved and laborious educator and collector, and, in recognition of some slight favors done, he shortly afterward presented me his entire cabinet.

When a mere lad, on my father's farm in Jessamine County, Kentucky, while plowing, hoeing, planting, and harvesting with my brother, I had picked up some beautiful arrow-points and a few stone axes, and placed them in a small box as my most valued treasures. College life, war, exile, and the experiences of an eventful and busy professional career, coupled with that strenuousness which faced all Confederates after the end of the struggle, had buried the memory of the flints and axes. The gift of Mr. Went awoke a slumbering admiration which for forty years had remained dormant, and with a well fixed, increasing yearning I at once set about gathering a store of these stone implements and remains. Like a tiger, the taste of blood only enlarged the desire, and soon my researches, as well as my demands for specimens, became a torment to my friends and acquaintances.

Opening a school of correspondence, by incessant inquiry the best fields in the State were soon located. Kentucky had been largely neglected among archeologists.

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Something had been written, but it had not permeated the public mind. It was something new in Kentucky, at that period, to have a really earnest, aggressive collector. In a little while my home became an exaggerated junk shop. It does not take one long to recognize the fact that a great collector must confine his work to a single line, and to attain preëminence, unless extraordinary outlays be made, to a limited territory. Kentucky to Kentuckians has generally appeared to be large enough for reasonable ambition, and so my collection was made a distinctly Kentucky aggregation. Here and there some stranger specimen of rare beauty from the outside crept into the cases, but the main purpose was to confine the museum to Kentucky archeological art. Persistent work, untiring patience, unflagging enthusiasm, and moderate outlay resulted in gathering together what some antiquarians are pleased to consider one of the world's best collections. The leading scientists of this country have not hesitated to say that in some respects this Kentucky cabinet has no superior among the best public and private collections of its kind, a fact which appeals very strongly to one's honest pride.

Long since the desire for mere numbers of specimens has passed away, and for the last decade only those things which are of highest excellence have been considered or sought. The pleasure and joy of massing such a multitude of prehistoric remains aroused a yearning and resolve to know all that could be learned of the people who created and used these implements, and induced a study of that which would give some account of those who, in the ages past, called Kentucky home, and who, hundreds and maybe thousands of years ago, lived and loved, toiled,

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battled, and builded along its water courses, in its valleys, on its hillsides, and over its mountain heights.

None who considered all that pertained to this vanished race could doubt that, in centuries gone by, a vast population had lived in the bounds of Kentucky; that they who constructed the fortifications, erected the monuments, and tilled the soil within the limits of the Commonwealth had been industrious, ingenious, brave, and thrifty, and that among the nations of their day and generation they had been leaders, ranking high in nationhood, and had stood for much that was bold, wise, and progressive.

The publication of my investigations, explorations, and discoveries from time to time in Kentucky prints and elsewhere, and lectures before intelligent audiences along such lines, have always called forth surprise and created a deep and abiding interest. Cultured people never fail to be fascinated and interested with the remarkable facts that the prehistoric remains of Kentucky furnish, and all who hear the story connected with the finds of archeological pursuits long to hear more of what these indestructible and inanimate witnesses have to tell of those who in the long "long ago" made Kentucky their abode.

This appreciation of the work done in opening the graves and revealing their secrets, in measuring the mounds and locating and investigating the forts and describing the implements of peace and of war, aroused the desire to put into some permanent form, with adequate illustrations, that which had been learned of these wonderful people; and so, when Colonel R. T. Durrett, the President of the Filson Club, asked me to write for

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that organization the twenty-fifth volume of its publications, and thus commemorate its silver anniversary, I consented to prepare this book. Its conclusions may not always meet those of many of its readers. Its reasonings may not always be logical, but it represents truly the things seen by him who writes, and may at least prove helpful to him who in after years, on a larger scale, with better facilities and more learning, undertakes to make a record of those who inhabited Kentucky centuries before Columbus turned the prows of his ships toward the setting sun, or found in the New World the verification of his deductions, which his fellows classed as the dreams of a sentimental theorist.

This work is written without any technical or scientific plan or purpose. Its object is not to be learned. The sole purpose is to place in permanent form illustrations of some of the most beautiful and best typical remains of this ancient people, and to publish in a way to attract the general reader, and for the information and instruction of the people at large, an account of those who, so many hundreds of years ago, loved Kentucky, and occupied it as their home.

The study of these first simon-pure Kentuckians ought to be as attractive and interesting as the study of men who lived in Egypt, Hindustan, China, Europe, or Africa in the centuries past. There are both sentimental and historic reasons which should induce Kentuckians as much to search for knowledge of the prehistoric people of the State as for that of the prehistoric men of other lands. It may be truly said that no practical good can come from learning aught of these people, of whom no printed and few pictorial remains exist, but if this be true where

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prehistoric Kentuckians are concerned, it is certainly equally true of those nations who inhabited other parts of the world, and of whom dim tradition, graves, and metal or stone implements alone speak to the people of the present age. There is much of human knowledge that is neither practical nor exact, yet which pleases the mind and widens the range of research and thought. It might give one more reputation among the professors and scientists to deal with these matters on different lines, and it would give more scholastic satisfaction. This book, however, is simply written for the people at large, and endeavors to tell in a way that can be fully understood and readily appreciated, in so far as can now be ascertained, the customs, habits, pursuits, achievements, and manufactures of Kentucky's first settlers.

There are many persons to whom I must confess a very high degree of obligation; they are so many that it is difficult to determine where to begin naming them.

First comes Mr. Samuel G. Tate, a brilliant young lawyer at the Louisville bar, whose selected cabinet, acute observations, wide reading, and enthusiastic pursuit of all that touch prehistoric Kentucky, has made him in this work to me absolutely essential. His journeys and investigations have added much to the store of prehistoric lore, and if his life is long spared he is destined to gain a leading place in this department.

Second, Professor H. Stahl, of Parkersburg, West Virginia, who came and spent several months in my home, and who, by his artistic genius in arranging the plates and designing photographic positions and investigating the facts, did for me that which I could not do for myself. He, aided by his own splendid cabinet and a patient study

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of forty years, has gained for himself a well-merited prominence among the archeologists of the Middle West.

Third, Mr. Harry L. Johnson, of Clarksville, Tennessee, a Louisville-born boy, who with his father, Captain James Johnson, has gathered more of that which is beautiful and exquisite in prehistoric art, explored more mounds, opened more graves, and handled more specimens in the archeological line than any private individual known to me of the present generation. Living on the banks of the Cumberland River, a few miles above Clarksville, in the last few years he has expanded and enlarged his explorations, and in his home on the river bluff are treasures which make archeologists turn green with envy, and of such vast extent that he himself only partly knows either their full beauty or their commercial value. His intense love for these treasures of the past, and his unlimited energy in their discovery and acquisition, have brought to him one of the most remarkable of existing cabinets. It ought to be the ambition of some possessor of great wealth to persuade Mr. Johnson to part with his treasures, and place them where wondering thousands might see their marvelous beauty. He has generously lent me for illustration in this book a number of Kentucky specimens, and I am indebted to him for help in many ways in getting material for this volume.

I beg to acknowledge my obligations to Professor F. W. Putnam, of Harvard University, whose scientific attainments and great scholarship lend a charm to his delightful writings; also Professor Warren K. Moorehead, whose industry and zeal, and wide knowledge of all that concerns prehistoric man, give him worthy pre-eminence among the archeologists of this country; Gen-

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eral Gates P. Thruston, whose "Antiquities of Tennessee" is certainly the most wonderful book from a local archeological standpoint that has been published in America. This work on the antiquities of Tennessee has been an inspiration and a help to all who deal with this delightful and interesting subject. No one can deal with primitive man in Kentucky without a deep sense of obligation to Professor Lucien Carr, of Cambridge, Massachusetts, formerly connected with the Kentucky Geological Survey. His acute power of analysis, his tireless pursuit of knowledge, and his wonderful breadth of reading excite surprise and admiration.

Among others who have lent me kindly and generous assistance I name Colonel R. T. Durrett, Louisville, Kentucky; Honorable James H. Mulligan, Lexington, Kentucky; Miss Belle Bennett, Richmond, Kentucky; Colonel J. Stoddard Johnston, Louisville, Kentucky; Honorable T. E. Pickett, Maysville, Kentucky; Honorable C. L. Searcy, Waco, Kentucky; J. Wesley Griffin, Esq., Warsaw, Kentucky; Honorable J. S. Brown, Warsaw, Kentucky; Miss Ora Hazelip, Brownsville, Kentucky; Honorable Thomas G. Stuart, Winchester, Kentucky; Honorable M. J. Holt, Louisville, Kentucky; L. B. Handley, Esq., Hodgenville, Kentucky; Stanley Frost, Esq., and C. J. Ogg, Esq., Berea, Kentucky; Reverend Cary F. Moore, Cynthiana, Kentucky; Doctor W. P. Taylor, Fulton, Kentucky; J. E. Pilant, Esq., Fredonia, Kentucky; Charles O'Neill, Esq., Frankfort, Kentucky; Major W. A. Elliott, Mammoth Cave, Kentucky; Miss Sallie L. Hazen, Glasgow Junction, Kentucky; Mrs. Ellen Rogers, Cadiz, Kentucky; Captain John W. Tuttle, Monticello, Kentucky; Doctor W. E. Baxter, Frankfort, Kentucky, Honorable B. F. Proctor,

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Bowling Green, Kentucky; Miss Annie L. Gullion, Carrollton, Kentucky; Honorable J. M. Richardson, Glasgow, Kentucky. There are many others whose kindly cooperation has placed me under lasting obligations.

These pages have been written while the author was either trying or preparing a lawsuit, every working day of the week. Many errors must have crept into the text, and the author in advance confesses the reasonableness of all fair criticism, and pledges himself, when the duties of life are less exacting, to prepare a new and enlarged edition, which shall exhibit his appreciation of the suggestions of all those who think he has made mistakes.

BENNETT H. YOUNG.

Louisville, June 1, 1910.

THE PREHISTORIC MEN
OF KENTUCKY

THE PREHISTORIC MEN OF KENTUCKY



THEORIES AND TRADITIONS AS TO WHO WERE THE PREHISTORIC MEN OF KENTUCKY.

IN all ages of the world there has been a universal interest in the study of mankind. No sooner do we hear of a race than there arises a desire to know something of their condition, their manner of living, and the source of their origin.

One of the first questions that comes up in connection with the prehistoric race in Kentucky is, Who were they? Were they the Indians rendered more ingenious, mechanical, and skillful by concentration in large communities, or were these prehistoric men of a different race, descendants of a different people, with differing characteristics and methods of living? It was several hundreds of years after the white people came to America and settled this continent before any thorough investigation was made of the antiquities which existed in this land. Those who came in personal contact with the Indians inquired of them what they knew of the antiquities of which this book treats. The answer almost without exception was that they knew nothing of the people who were

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engaged in the building of these mounds, how they were erected, whence the people came who made them, or whither they had gone.

No human memory has revealed and no hand has detailed that which occurred to these primitive people into whose past we attempt to throw the light of research. Before all who undertake to investigate this question there is a mysterious past, and the silent and mute vestiges erected in stone and earth are all that reach the eye of him who would penetrate into the secrets of this vanished people. Along the tributaries of the Mississippi may be found the imprint of many things of this mysterious race, whose mounds and whose temples, and whose forts built of indestructible material, testify that in the valleys and the prairies and on the rich hillsides of this vast and fertile territory there was once a people who had a history, and who in war and peace must have been brave, patriotic, and industrious. The scant material at the command of the inquirer renders his task difficult and sometimes burdensome. Traditions here, mounds there, forts elsewhere, temples of worship scattered all through this territory, are the sources from which information must be secured and on which deductions must be based.

The Delawares have a tradition that, many centuries ago, a warlike race emerged from the West and started upon a course of conquest. But this mighty host, when it approached the territory contiguous to the Mississippi River, found as a bar to its progress a valiant, aggressive, and resourceful people. These traditions have been so beautifully told by Doctor Thomas E. Pickett, one of the most charming writers that Kentucky has ever pro-

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duced, that we can not forbear quoting from his pamphlet entitled "The Testimony of the Mounds." He says:

"The two nations thus confronting each other upon the banks of the Mississippi measured the situation with a civilized eye—the Lenni-Lenape diplomatically parleying for the right of passage, and the subtle Allegewi hypocritically affecting to hear. As a result of these diplomatic negotiations, the Lenni-Lenape were treacherously assailed in an attempted passage, and driven back, though not utterly destroyed, by their perfidious foe. But the tradition further relates that there was a coincident migration of the warlike Iroquois from the far West on a higher line of latitude, and that this people were seeking to effect a passage of the same stream at another point. The Lenni-Lenape, speedily rallying from their repulse, strike a military league with the Iroquois, proclaim a war of extermination against the Allegewi, reduce their strongholds, desolate their lands, and drive them southward in disastrous retreat—their chosen seats being abandoned to the conqueror in tumultuous haste, and themselves becoming a nation of wanderers upon the shores of the stream which they had perfidiously attempted to defend. But this tradition of the Delawares does not stand alone. That the prehistoric inhabitants of Kentucky were at some indeterminate period overwhelmed by a tide of savage invasion from the North, is a point upon which Indian tradition, as far as it goes, is positive and explicit. It is related, in a posthumous fragment on 'Western Antiquities,' by Reverend John P. Campbell, M. D., which was published in the early part of the present century, that Colonel James Moore, of Kentucky, was told by an old Indian that the primitive inhabitants of this State

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had perished in a war of extermination waged against them by the Indians; that the last great battle was fought at the Falls of the Ohio; and that the Indians succeeded in driving the aborigines into a small island below the Rapids, 'where the whole of them were cut to pieces.' The Colonel was assured that the evidence of this event rested upon facts handed down by tradition, and that he would have decisive proofs of it under his eyes as soon as the waters of the Ohio became low. When the waters of the river had fallen, an examination of Sandy Island was made, and 'a multitude of human bones was discovered.' There is a similar confirmation of this tradition in the statement of General George Rogers Clark, that there was a great burying-ground on the northern side of the river, but a short distance below the Falls. According to a tradition imparted to the same gentleman by the Indian chief Tobacco, the battle of Sandy Island decided finally the fall of Kentucky, with its ancient inhabitants. When Colonel McKee commanded on the Kanawha (says Doctor Campbell), he was told by the Indian chief Cornstalk, with whom he had frequent conversations, that Ohio and Kentucky (and Tennessee also is associated with Kentucky in the prehistoric ethnography of Rafinesque) had once been settled by a white people who were familiar with arts of which the Indians knew nothing; that these whites, after a series of bloody contests with the Indians, had been exterminated; that the old burial places were the graves of an unknown people; and that the old forts had not been built by Indians, but had come down from 'a very long ago' people, who were of a white complexion and skilled in the arts.

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"In addition to this traditional testimony, various and striking traces of a deadly conflict have been found all along the Ohio border. To say nothing of the vast system of fortifications covering exposed and important points, and evidently designed as a general barrier against hostile incursions, there are significant traces of former conflicts in the old 'battlefields' of Bourbon, Pendleton, and Bracken counties, which, clearly indicating occurrences beyond the pale of the historic period, confirm in some measure the traditional theory or belief of a protracted and desolating struggle for the possession of this borderland. And doubtless the familiar appellation of 'the Dark and Bloody Ground' originated in the gloom and horror with which the Indian imagination naturally invested the traditional scenes and events of that strange and troubled period. General Clark declares that Ken-tuck-e in the language of the Indians signifies 'the river of blood.'

"It is not improbable, judging from the frequency with which fortifications occur upon the banks of water courses, that the bloodiest battles were fought upon the banks of navigable streams. Ken-tuck-e, to the Indian, was a land of ill repute, and, wherever a lodge fire blazed, 'strange and unholy rumors' were busy with her name. The old Indian who described to Colonel Moore the sanguinary and decisive battle of Sandy Island expressed great astonishment that white people could live in a country which had been the scene of such conflicts; and an ancient Sac, whom Colonel Joe Hamilton Daveiss met at St. Louis in 1800, gave utterance to similar expressions of surprise. Kentucky, he said, was filled with the ghosts of its slaughtered inhabitants; how could the white man make it his home?"

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While the early authorities questioned the connection of the American monuments with the arts and science and culture of the European, yet they all admit that these things, found in America when the white man came, have intrinsic evidence which demonstrates conclusively that they were constructed hundreds of years before. How little the early wise men of America knew of these antiquities has in the last fifty years been fully and thoroughly demonstrated. Doctor Benjamin Franklin, in reply to a learned man who made inquiries concerning these remains, sagely suggested that the works in Ohio had been constructed by De Soto, and so wise and learned a man as Noah Webster, after hearing Franklin's theory, undertook to defend and prove it. Subsequently, however, he abandoned the views which he had then set forth, and concluded that they were the work of the Indians. Other authorities insisted that while these remains were not constructed by De Soto and his followers, yet they belonged to an age that antedated the discovery of the country, and they vigorously assert that these wonderful antiquities were not the product of Indian industry or skill, but of another people who were not savage, but who had some knowledge of arts and sciences and also some well-defined ideas of political organization. Early in 1800 there appeared in these discussions two very important characters, Reverend Thaddeus M. Harris, of Massachusetts, and Bishop Madison, of Virginia. It is said of these two archeologists that they were among the first who united opportunities of personal observation with the advantages of scientific culture, to impart to the public their impressions of Western antiquities. They represented the two classes of observers whose opposite

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views divided the sentiment of the country. The first class saw no evidence of art beyond what might be expected of existing tribes with the simple difference of more numerous population and consequently better defined and more permanent habitations; the others found proofs of skill and refinement to be explained, as they believed, only upon the supposition that a superior native race, or more probably people of foreign and higher civilization, once occupied the soil.

Bishop Madison was an advocate of the first theory and Doctor Harris undertook to make good the claims of the second, and urged with great vigor that the Mound Builders were Toltecs who, after residing for a time in the regions of the Mississippi Valley, moved south into Mexico. These two views were pressed with great force and earnestness by many learned and careful observers in later years. As has been said, on this subject two opinions are held and strongly advocated; the first, that the people who constructed these remains were of a different and superior race to the Indian. Those so holding contend that the remains found in the shape of mounds, teocallis (or places of worship), fortifications, implements of various kinds, indicate that these people were a race of superior culture to the Indians; that these remains point conclusively to the fact that those who constructed them were an agricultural people of sedentary habits, and lived in organized communities; that the works themselves bear evidences of mathematical and engineering knowledge which the Indian never possessed or exhibited; and that the fortifications show that these people were at war with other nations, and that in such warfare it became necessary for these Mound Builders to erect stone, wooden,

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and earthen defenses, and that the evidences show that these were displaced by more aggressive and warlike foes. They also insist that the Indians themselves declared that they knew nothing of the people who builded these structures, and that they were concluded ages before even the red men found them, and that they could tell nothing concerning the origin or use of these monuments. There are some who insist that these monuments must have been erected by a people different from the American Indian, yet they do not attempt to tell who the Mound Builders were. They hold no opinion upon the racial and ethnical relations of those who constructed these monuments, but declare that the Indian was not capable of doing the work which was required in their construction.

The second class insist that there is nothing in these monuments to indicate greater genius, greater skill, or greater patience than the American Indian has exhibited along many other lines; that it is established beyond all question that in historical times the Indian constructed mounds and fortifications, and further, that their burials are similar in most respects to those of the Mound Builders. They say that the mere fact of structures being erected for military purposes demonstrates nothing, because the different Indian nations were themselves constantly at war with each other, and were known to make long marches in order to punish or destroy other Indian nations who had inflicted upon them some real or imaginary wrong. They say further, that there was scarcely a tribe from the Atlantic to the Western plains that did not have some capital or fixed location in which large numbers of their people resided, and that these subsisted upon the prod-

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ucts of agriculture. They insist that De Soto found all the tribes he visited were successful in cultivating maize and various vegetables, and that the early voyagers along the Atlantic shores found the same thing true from Florida to Massachusetts, and that John Smith and his colony depended largely for subsistence upon the products raised by the Indians. Champlain, La Salle, and Marquette all observed that the Indians were engaged in successful agriculture, and, instead of being dependent upon the chase, really lived almost altogether upon the products of the soil. They insist that the specimens of art from the mounds "do not excel in any respect those of the Indian tribes known to history." The advocates of this theory insist that there is conclusive evidence to show that in New York and in the Southern States the Indians did build mounds and embankments that are essentially of the same character as those found in Ohio; that during the examination of one of the greatest of the Ohio systems of works, which are among the most elaborate of their kind—namely, the remains at Circleville, Ohio—were found articles of iron and silver, showing conclusively that these were built after contact with the whites, and therefore by the recent Indians. They further argue that as the Indians are the only people except the whites who, so far as we of this age know, have ever held the region over which these remains were scattered, that therefore it requires proof of the most positive character to show that they were not the work of the red Indians. They contend that this proof is lacking, and that the reasonable conclusion is that they were built by the red man, or the American Indian.

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Some of the most acute and careful of all American writers have engaged in discussions on this subject, and probably no fact of American history has brought to its elaboration more brilliant, scholarly, or enthusiastic authors. To the average mind, after hearing all that can be advanced by either side, it may be safely said that the better of the argument remains with those who insist that these monuments were erected by the red Indians or their ancestors, but even those who maintain this view with the greatest pertinacity and defend it with the greatest ability are compelled to admit that their own conclusions are not always satisfactory, and that there are many things said by those who oppose their theory which carry with them much weight, and which necessarily inject some doubt into the conclusions which they have reached and which they so ardently maintain. A book of a thousand pages could not fully and thoroughly set forth all that has been vigorously said on both sides of this question. As these people seem to have had no written language, and no system of transcribing even in stone the story of their life and of their origin, after all there must be much of conjecture and there must ever remain, at least in some minds, a doubt of the certainty that these wonderful antiquities were constructed by the American Indian. It is not the purpose of this book to argue out this question, but we can only state succinctly and fairly the various theories upon either side of this subject, and then deal with the things about which we can be reasonably certain in connection with those who undertook the erection of these attractive and interesting structures, and who, in their completion—considering the implements they had at hand—demonstrate certainly not only great genius and great

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taste, but an energy and persistence which are both striking and surprising, and it may be said almost incredible. Without wagons or carts, or beasts of burden, they undertook the erection of earthworks which fill us with admiration at the courage and the patience which would seek to accomplish such marvelous tasks. The greatest of all the mounds is that at Cahokia, Illinois, and even to the men of the present day the construction of such a work would entail an outlay of money and time which would stagger the enterprising and well-equipped constructor of modern days. The monument erected on the battlefield of Waterloo is one of the most notable instances of modern earthworks. Compared to the great mound at Cahokia, its building would be but child's play. This monument at Waterloo is justly esteemed one of the most effective of all monuments ever builded to commemorate the deeds of men.

The base of the Cahokia mound, north and south, measures 998 feet, east and west 721 feet, height 99 feet, width of lower terrace 30 feet, outward extent of terrace 200 feet, and the area of the base of the mound is estimated to cover sixteen acres of ground. Omitting much that might be counted within the mound and represented in the labor of its erection, the contents covered 21,690,000 cubic feet. It has been estimated that it would require, according to the calculations, one thousand men nearly five years to erect such a mound with the means that the prehistoric inhabitants had at their command. We are bound to conclude from the structures of earth and stone which were fashioned by these people—whether they be historic or prehistoric, whether they be Indians or belonged to another race—that they were a people who pos-

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sessed considerable mechanical genius and engineering skill, and that there was nothing too great for them to undertake in the commemoration of their distinguished dead, or for the purposes of worship, or for places of safety when imperiled by flood. If these earthworks were used ceremonially or for purposes of worship, they exhibited an intensity of zeal and consecration to the objects of their adoration which have few parallels in human observation. If they were used for the purpose of burial, then they demonstrate a love and veneration for the dead which have no equal in the annals of mankind. If they were used for purposes of residence or refuge, they likewise exhibit a zealous activity and untiring industry that excite, as well as deserve, the admiration of all races and people.

BEGINNINGS OF ARCHEOLOGICAL RESEARCH IN KENTUCKY.

The first permanent white settlement in Kentucky was in 1775. Those who had come into the State floated down the Ohio and traveled along the difficult and dangerous Wilderness Road, built their stockade at Boonesboro and their cabins at Harrodsburg, and began the conquest of the wilderness which on every side, in its density and in its difficulties, faced the new-coming Anglo-Saxon. The men who thus came into the State had no opportunity for archeological investigation; they were busy in the defense of their lives, in cutting down the mighty forest trees, in preparing their corn patches and taking care of them. The first cabin at Lexington was

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built in 1779. On the first of April the pioneers began to fell the trees, clear the space, and a blockhouse, surrounded by a stockade commanding Maxwell Spring, was the beginning of that beautiful and progressive city.

John Filson, Kentucky's first historian, noted the fact that Lexington had been inhabited long years before the coming of the white man. As early as 1776, some hunters from Boonesboro had their curiosity excited by the strange appearance of a pile of stones of curious workmanship which they saw in the woods covering the place where Lexington now stands. The removal of these stones is said to have revealed the entrance to an ancient catacomb. A gradual descent from the opening covered by these rocks revealed a passage four feet wide and seven feet high, leading into a large stone room in which were numerous niches containing human bodies in a state of preservation. As late as 1782 this catacomb was visited by numbers of Indians and whites, but it was early despoiled of its ancient treasures, and the bodies, mummified by some process, destroyed.

Early traditions tell that, when peace had come and the white men had driven the red men out of the territory, this underground burial place was visited and inspected. Thomas Ashe, a traveler of questionable veracity in this country in 1806, claimed in his book, published at London in 1808, that he had visited and explored this marvelous catacomb, and added not a little to the early traditions which existed concerning it. The truth of much that he claimed to have seen rests entirely on his statements. It was three hundred feet long, one hundred feet wide, and eighteen feet high. The dust and rubbish which covered the floor was that which had come from the bodies

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entombed within its depths. It is a strange fact that the entrance to this burial place is now totally unknown. Within its vacant chambers no voice is heard and no footstep disturbs the silence of its dead; above, the tide of commerce and trade sweeps over the surface which hides from human eye the story of this ancient tomb. Be this as it may, it is a fact that can not be denied that Lexington was once the center of a great prehistoric population. About the city are found the remains of earthworks; whether they be fortifications or whether they be sacrificial altars, they were certainly constructed by people who, for savages, were well advanced, and the vast number of implements and arms of stone tell the story that they were used by a people both intelligent and brave.

When Kentucky pioneers undertook, in 1775, to make a permanent settlement within the limits of the State, they had neither the time nor the ability to investigate any of these remains, but as soon as the forest was leveled and the fields began to be cultivated, they observed a large number of artificial earthen mounds. They inquired of the red man what was his knowledge of these tumuli. He answered, "Our people did not build them; they belong to a people whom our forefathers fought and drove from the territory, but whence these people came and whither they have gone we do not know." As cultivation extended and the area of the fields increased, these mounds became more distinct and better recognized, and then, led by curiosity, their contents were examined; the fortifications or places for worship which had been builded with earthen embankments were noted, but it was not until 1819 that the subject received any scientific or intelligent investigation.

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In 1788 Transylvania Seminary was removed to Lexington; in 1794 it had reached a high degree of efficiency, and in 1798 the pretentious name of Transylvania University was given the infant institution. To this institution, in 1817, had come Constantine Samuel Rafinesque, a young professor full of enthusiasm and zeal. These ancient monuments of a vanished race aroused not only the curiosity, but quickened the enthusiasm in the mind of this distinguished and brilliant young student. He was professor of natural sciences, and issued a thin octavo volume, in 1824, entitled "Ancient Annals of Kentucky." For four years he had been diligently engaged in discovering and surveying these earthen and stone monuments, and had been able to locate one hundred and forty-eight sites, and five hundred and five ancient remains or monuments. This remarkable man, at that period among the most learned in America, was born in Constantinople in 1784. He had gone with his father to France and Italy, and, after residing in various cities in both of these countries, had come to America in 1802. Filled with the spirit of travel, as well as the desire to make a great collection of botanical and other specimens, on the invitation of John D. Clifford, of Lexington, he was induced to visit the Western States. From Pittsburgh he floated down the Ohio, visited Louisville, where he remained long enough to catalogue the fishes and shells of the Ohio, and later visited John J. Audubon, the distinguished ornithologist, who then had his home in Henderson. From Henderson he went by a roundabout way to Lexington, to visit his friend Mr. Clifford. He was persuaded by Clifford to settle in Lexington upon the promise of a professorship in Transylvania University. Having determined to accept a place in that

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institution, he returned to Philadelphia preparatory to making his arrangements for his residence in the West. Upon his return trip, at Chillicothe, Ohio, he first saw the great earthen monuments, or mounds or altars, of the ancient people of America. He had passed these same mounds in his travels down the Ohio, but either lack of time or the density of the forest on both sides of the river had prevented an examination by this acute observer. These remains filled him with astonishment as well as admiration, and he undertook at once a study of them. In 1819 he returned to Lexington, to remain seven years as professor of natural sciences in Transylvania University. This gifted man taught French, Italian, and Spanish to all who cared to know these languages. With others who had been enthused by his learning and genius, he undertook to establish in Lexington a botanical garden. During those seven years he essayed to secure specimens and materials of all kinds for a book which he proposed to call "A History of the Earth and Mankind, Principally in America." The first outgrowth of this arduous and laborious study and research was made public in a book entitled "Ancient Annals of Kentucky," published as an introduction to Marshall's "History of Kentucky," edition of 1824, and also in separate book form.

In June, 1825, he left Kentucky, and died fifteen years later in Philadelphia, September 18, 1840. For his period he was possessed of wide learning. In 1836, about four years before his death, in commenting upon his own life, he says "in knowledge he had been a botanist, naturalist, conchologist, geologist, geographer, ethnographer, philologist, historian, antiquary, poet, philosopher, economist, and philanthropist, and by profession a traveler, mer-

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chant, manufacturer, collector, improver, professor, teacher, surveyor, draftsman, architect, engineer, palmist, author, editor, bookseller, librarian, secretary, chancellor, and he hardly knew what he might not become, since he never failed to succeed in whatever he applied himself to if it depended on himself alone, unless impeded and prevented by lack of means or by the hostility of the foes of mankind."

His investigations and discoveries and the putting forth of his theory created a strong spirit of archeological study, and to this wonderful and marvelous intellect we are indebted for a large proportion of what we know now of the prehistoric remains of the State. There was no limit to his energy; there were no bounds to his research; for a man of his period, there was no parallel to his vast and extraordinary knowledge of Nature. He located prehistoric remains as early as 1824 in forty-one counties in the State. When we consider the difficulties of travel in Kentucky from 1819 to 1825, it is almost impossible to believe that this wonderful man could have been able to have produced the maps and drawings of prehistoric sites and monuments scattered over such a vast territory. Beginning at Greenup on the east, his explorations extended as far west on the Ohio River as McCracken County; beginning on the Ohio River at Louisville, extended in a straight line of investigations southward and westward through Knox and Whitley, and covered almost the entire area of the Bluegrass. Remote counties like Adair and Clay and Harlan were not exempt from his trail, and Perry, Pulaski, and Rockcastle gave up to his genius the story of their remains. He was enabled to find in Bourbon County alone five sites and forty-six monuments, a circus of fourteen hundred and fifty feet, and a town built

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upon the lines of a polygon which had four thousand six hundred and seventy-five feet of walls. Near Augusta he found and described a great battleground, from the site of which he unearthed rings and copper medals upon which unknown letters had been stamped. In Fayette he found, on South Elkhorn and on North Elkhorn, sites of circuses and towns, and a large number of graves from which were taken East Indian shells. In Hickman he discovered and described teocallis four hundred and fifty feet long, ten feet high, and thirty feet wide; in Livingston an octagon remains with walls two thousand eight hundred and fifty-two feet in length; in McCracken, two hundred and fifty miles away from Lexington, he found a square teocalli twelve hundred feet long and fourteen feet high; in Montgomery, elliptical or ditched mounds and circuses or circular temples; in Rockcastle a stone grave two hundred feet long and five feet wide and three feet high; in Scott a ditched town; in Trigg a walled town with a circumference of seven thousand five hundred feet, and mounds and teocallis almost unnumbered; in Warren a ditched town of octagonal shape one thousand three hundred and eighty-five feet around; in Whitley a town with houses and a teocalli three hundred and sixty feet long and one hundred and fifty feet wide and twelve feet high, and the remains of towns with houses; in Woodford an octagon teocalli twelve hundred feet long and eight feet high, and on South Elkhorn a town which required twenty-seven hundred feet of embankment to enclose its area. Altogether in Kentucky he claimed to have discovered one hundred and forty-eight ancient sites and five hundred and five monuments. He surveyed and described many of these.

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It is greatly to be regretted that a man of Rafinesque's boundless energy, enthusiasm, and wide learning had not been more accurate in his observations and had not held in check his marvelous imagination. His work is chiefly valuable in locating the sites of these aboriginal works. Many of the monuments pointed out by him were natural and not of artificial origin. His writings, however, aroused widespread interest in the subjects he discussed and led others to examine the works and make record of what were the real conditions which existed.

PERIOD IN WHICH THESE PEOPLE LIVED IN KENTUCKY.

When our pioneer forefathers came over the mountains and settled in the State, the monuments of earth and stone were hoary with age. A large number of them had produced on their crests and sides timber which would require hundreds of years to grow, and existing under such conditions as to give the timber itself an age that antedated 1492. There are no annals to tell aught of these structures, but the timber, stone implements, and bodies long before interred, all taken together, in some respects at least are conclusive of the fact that these monuments of various kinds have been in existence in Kentucky more than six hundred years. One instance is known in which a gentleman entered in his diary a record of the felling of a tree on a certain mound in Madison County, Kentucky, in 1787. The writer examined the mound in 1894, one hundred and seven years after the tree had been cut down. A careful study of the number of rings, which

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were clearly traceable on the stump, showed them to be two hundred and thirty-seven, so that the mound must have been constructed two hundred and thirty-seven years before 1787, thus satisfactorily determining that the mound was built before 1550. Recently the reliability of the rings of trees as an indication of their age has been questioned, but after observations of half a century in Kentucky and diligent inquiry among those who have observed the growth of timber, the writer feels confident that in the predominant timbers in Kentucky, such as hickory, poplar, oak, hackberry, beech, walnut, and ash, the rings show substantially the age of growing trees. This is especially true of timber grown on the highlands. The sycamore and cottonwood, down in the river bottoms, might not give the same symmetry as the species above indicated. Severe droughts occurring in Kentucky might stop the growing of the tree, and afterward, in the fall, abundance of rain and the genial sun might make a double growth, and thus two rings show for the same year; but this would not be likely to occur more than once in thirty or forty years.

In another instance, near Lebanon, Kentucky, a mound was opened in which were found three very remarkable relics of the primitive age, namely, copper spools. These spools had been hammered out of copper which had been brought from the copper mines in Michigan. They were discovered in the center of the mound. This mound had contained two growths of timber, and the combined ages of the two would give an age to the structure of not less than five hundred years. On the mound were growing trees which it was absolutely certain had begun their lives three hundred years before, and there were, on the

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ground beneath these, remains of a growth which had antedated that which was then standing, so that the mound must have had an age exceeding five hundred years.

Another instance is recalled of a pipe that was taken from the root of a beech tree which had grown upon a mound near Green River. When this tree, which was calculated to be four hundred years old by a most expert antiquarian, was overturned, within the grip of its tap root was a stone pipe. This pipe had been broken into nine pieces, but with a patience and industry almost surpassing credibility, Colonel Robert Munford, who found it and afterward gave it to the writer, proceeded with his search for the broken fragments of this handsome pipe for a period of eight months, when his persistence was at last rewarded by finding the ninth piece.

These mounds were grim with age when Marquette, in 1693, in his bark canoes, glided down the Mississippi, and when La Salle, in 1669, starting from the Lakes, pushed his boats to the head of its tributaries, across a narrow portage to the Allegheny, and floated with its current to where that stream joins its waters with those of the Monongahela, and then on the bosom of the "Beautiful River" to the present site of Louisville.

It is not difficult to demonstrate that these remains are pre-Columbian. How many hundreds or thousands of years they antedated the period of the discovery of America can only be conjectured. The clay soils of Kentucky were especially adapted for the building of the earthworks and for the retention of their forms when erected. They washed but little, and the rank vegetation which at once sprung out of the fertile soils insured a grassy covering which rendered erosion slow and ineffec-

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tual to wear away the embankments. To these concurring causes the world is indebted for the substantially complete preservation of these witnesses to the past of the ancient men of the State. These are the calendars from which we make the calculations which figure out the centuries that have elapsed since these patient and industrious people tilled the soil and builded homes within the borders of the Commonwealth.

STONE GRAVE BURIALS.

Stone grave burials are found over the greater part of Kentucky. More frequently remains of this kind occur in the south-central and the western parts of the State, though they have been found as far east as Greenup County. They occur in connection with almost every large mound group, and in and about every fortified village site. We find them grouped in large cemeteries and small family burial grounds, and single isolated graves are not uncommon. Nearly every large farm along the fertile valleys of the Cumberland, Tennessee, Green, and Barren rivers has its quota of stone graves.

The prevailing type consists of a rude stone box or cist of rectangular form. The graves are usually shallow, not exceeding three feet in depth. After the earth had been removed, stone slabs of more or less regular form were placed in the bottom of the excavation, and similar slabs arranged on edge about the sides and ends, and these, after the body had been laid within, were covered with slabs of like shape. Frequently the bottom stones were omitted and the body probably laid on a mat or

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skin, or upon the earth. The slabs used were of irregular shape, and show no attempt at dressing other than having been roughly blocked into form with stone hammers. Usually they were rudely fitted together, about as carefully as the stone pavements which were laid along the streets of towns in Kentucky one hundred years ago. Through the crevices between the stones, the earth, during the centuries of interment, has filtered, entirely filling the grave. In rare instances the slabs were nicely joined, the cracks and crevices being closed with smaller stones so as to effectually guard against the silting. When the exploring rod of the relic hunter strikes one of these cists, the hollow sound emitted gives certain promise of the reward of seeing a prehistoric man of Kentucky just as he was laid away centuries ago, minus only the flesh and the more perishable materials which were enclosed within his sepulchre.

These depositories of the dead have been found to be rich in remains of all kinds, such as vessels of pottery, pipes, gorgets, beads, pendants, paints, tools of the artisan, and implements of war and the chase. All these bespeak the high degree of skill attained by these people in the arts and industries of aboriginal life. These objects, placed with loving care beside the dead, indicate a belief in another state of existence. If the dead were really dead, with no future life before him, why place within easy reach the well-filled vessel of food, or string about his neck glittering beads of copper and shell, and upon his breast wonderfully wrought gorgets? Why deposit by his side implements of war, the chase, or the tools of the workman? The custom of thus storing the graves with things which were beautiful and helpful to the living,

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bespeak plainer than can words the deep-seated conviction that death is not the end, that in other spheres from that which he had departed the dead would live again the scenes of this life, accompanied and served by the spirits of the inanimate objects interred with his remains.

Small stone cists measuring not more than two feet in length by fifteen inches and even less in breadth, are frequently unearthed. In these the bones of the dead, after having been disarticulated, were placed in a mass. The small size of these graves in former days gave rise to the belief that the valleys of the Cumberland and Green rivers were once the home of a race of pygmies. We are of the opinion that many of these small cists contain bones which were brought from a distance, probably from some battlefield. The intense reverence of the red man for his dead lends plausibility to the idea that these skeletons may have been borne from some distant section to be given sepulture among their own people. In Christian County, near a village site on Little River, these small burial cists occur in large numbers in immediate proximity to larger stone graves; and the indications from the bones and crania are that they were the same people, who buried their dead under different conditions. Very seldom do implements of any kind accompany this form of burial. These graves are found chiefly in Allen, Barren, Edmonson, Trigg, and Christian counties. Occasionally, in the stone grave cemeteries, are cists of large size containing the remains of two or more persons. In some the position of the skeletons indicate that the dead were buried side by side in the flesh; in others the bones of many dead are intermingled.

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In Clark County, on what is known as the Devil's Backbone, a few miles north of Winchester and in contiguous territory, are stone graves measuring about three and a half feet in length by two feet in breadth, in which bodies were buried in a sitting or squatting posture, the knees drawn up against the breast and arms down by the side. In many of these graves were found deposits of pottery and implements of various kinds.

In the northern portion of the State were formerly seen stone graves of a most peculiar and interesting type. Northern Kentucky, together with the extreme southern portion of Ohio, present certain features in common, which indicate that they were once occupied by the same people. Doctor Cyrus Thomas, in speaking of this region (Twelfth Annual Report of Bureau of Ethnology, page 576), says: "There is strong evidence of an intrusive element, or as appears more likely, a preceding and independent element." In Brown County, Ohio, Mr. Fowke, connected with the Bureau of Ethnology, explored and described several burials enclosed by a circle of flat stones set on edge, the body or bodies being placed on a pavement of stones near the center, and covered with a mass of rock or earth. Not far from Ripley, in the same county, he examined another grave which had been previously opened, but enough remained to show that it had been constructed by placing around the body, which lay upon the earth or floor of rock, several rows of stone slabs on end slightly inclined inward, the rows forming an ellipse. These slabs were supported on the under side by a mass of small rocks tightly wedged in. Upon these stones were placed others which were forced in between the edges of those of the lower tier. Upon this second tier

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a third tier was similarly placed, the edges likewise being forced in between those of the second tier, and this was evidently continued, each tier having a greater inclination than the one below, until an arch was formed entirely enclosing the space about the body. Just across the Ohio River, on the Kentucky side, near the town of Dover, in Mason County, there was formerly a large group of these graves, also others to the westward in Bracken County. However, Mr. Fowke, who conducted extensive explorations in that neighborhood, was unable to find any which had not been torn up by white men to get the stone, which was used in the construction of roads, in building outhouses, residences, and chimneys, and even in furnishing lime.

Several stone graves of unusual form were discovered many years ago by Professor N. S. Shaler upon the summit of one of the river bluffs on the bank of the Ohio River four miles above Newport, in Campbell County. In a letter to Professor Jeffries Wyman, under date of December 18, 1868, he describes them as follows: "These were formed by placing a curbing of regular fragments of considerable size, so as to form a circle ten feet in diameter, from which flat stones were inclined outward, shingled one over the other so as to form a band about six feet wide. Beneath the stones of this band, or in the crevices between them, were placed a great number of detached human bones which had evidently been deposited there in the fragmentary state in which they were found." Professor Shaler thought these graves quite recent, but the probability is that they antedated the stone grave cists of Central and Southern Kentucky.

We are indebted to Professor F. W. Putnam, of the

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Peabody Museum of Archeology and Ethnology, for first exploring and publishing an account of an unusual type of grave found in Barren and Monroe counties. Professor Putnam says: "These graves were nearly circular, between four and five feet in diameter, and about three feet deep. One was carefully opened and the contents taken out. These consisted of portions of fifteen human skeletons, and fragments of pottery. The bones showed that the bodies buried were those of persons of various ages, from three children who had not lost their first set of teeth to one person of old age. The grave had been formed by digging a hole nearly circular and about three feet in depth. Slabs of limestone, about three feet long and from one foot to two feet wide, brought from some distance, had then been placed on end around the hole, and the bottom had been carefully covered with thin shale brought from the creek a quarter of a mile away. The bodies of the adults had evidently been arranged in a sitting posture against the upright slabs, and all at one time. Only fragments of the skeletons of the three children were found, and the position in which they had been buried could not be determined. The earth had been thrown over all, and a few small, flat stones placed above. The fragments of pottery found were near the surface, and may indicate that vessels and perhaps other articles had been placed on the surface over the grave, and not buried with the bodies, as is more commonly the case."

At the time of the examination of these graves by Professor Putnam many had been plowed over, and human bones from them whitened the field for half an acre in extent. He observed about thirty of these graves, and

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thought that a large number must have been destroyed by cultivation of the land about them. In an account of these researches given at a meeting of the Boston Society of Natural History, in 1875, he says of these sepulchres: "The fact that all the bodies must have been placed in the grave at the same time, and that they were those of persons of various ages, from three children who had still the first set of teeth, as shown by fragments of jaws found, to a person quite advanced in age, while the majority were evidently of middle age,—and also the peculiar hole in one of the arm bones, perhaps indicating a blow with some pointed instrument—give opportunity for speculations which can not be proved or disproved by these silent relics of a once populous race inhabiting the beautiful country where their bones were laid so long ago that tradition of the more recent Indian tribes gives no clew to them—whence they came or whither they went, all is lost in the great mystery of the past, and only their empty skulls and wonderful monuments of industry, with their implements of skill, are left to tell us of their former power. We know not if these burials indicate famine, pestilence, war, or the unholy sacrifice. We can only conjecture that they were not the graves of persons who had died a natural death."

In various parts of Kentucky burials were made under piles of stone or cairns. These have been found quite frequently in Nelson and adjoining counties. At least one has been observed in Union, and many in Greenup. It was evident that in this class of burials there was a slight excavation, half a foot to a foot deep, and over the body, after it was deposited on the ground, were laid piles

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of stone varying from two to four feet in height and running from six to twelve feet in diameter. These stones were laid with some appearance of care, and while they were not put in courses, it was apparent that the structure had been carried upward by regular deposits of stone, and when completed a sort of arch was formed over the top of the ground. As these stones were penetrable by rains and melted snows, there was little to indicate the nature and character of the skeletons placed beneath. A fragmentary bone here and there, and the always distinguishable dust which is created by the dissolution of the body, were the only evidences that remained of those who were thus laid away in the long past.

In Clark, Montgomery, Madison, Union, and some parts of Fayette County, and along the banks of the Cumberland, Tennessee, Green, and Barren rivers, thousands of burials were made without the use of either stone or wood as a protection to the bodies. They may have been wrapped in skins or bark, and thus protected by some temporary covering. About six miles from Louisville, on the Bardstown Turnpike, on a place owned some years ago by Mr. Armstrong, was a very large cemetery. The ground which contained the bodies had been long cultivated; a few strokes of the spade or the grubbing hoe at any point would bring up human bones, accompanied by arrowheads and fragments of pottery. About four miles southwest of Richmond, on a farm formerly owned by John D. Harris, from the indications it appeared that a cemetery covering one hundred acres had been practically filled by graves of this description. At almost any point in a large field which had been cultivated for many years, and at the time of the author's investigation

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was in tobacco, a few strokes of the spade would exhume numbers of bones, accompanied by flints and here and there fragments of mica. The same is true in parts of Wolfe County, and some parts of Clark and Montgomery. It is undoubtedly true, as we have said, along the Cumberland and Tennessee, in the bottoms, without reference to mounds or stone excavations or any protecting element, immense numbers of these people were buried.

Whether these different forms of burial marked different periods in the history of the prehistoric men of Kentucky it would be difficult now to say, but the condition of the bones would indicate that these burials in which neither stone nor mounds were used were of the more recent origin.

Here and there bodies have been found laid on the surface of projecting shelves in shallow caves, or "rock houses." Six miles northeast of Nicholasville, near the town of Keene, when a lad the writer observed skeletons of the prehistoric people deposited in this way. Professor R. S. Robinson calls attention to burials in rock shelters near Hardinsburg, which he visited in 1874. In Central Kentucky, frequently in these cave shelters numbers of burial places have been found. These "rock houses," as the shallow depressions are called, are found principally in the region of the Waverly and sub-carboniferous sandstones, and are caused by the more rapid recession of the base than the summit of the cliff, under the wear of the elements. In some cases the excavations extend back fifty and even sixty feet, leaving overhanging roofs of solid rock. These overhanging cliffs afford protection from rain and snow, and became favorite resorts for stock and even people, and there are several

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instances in which the prehistoric people builded structures with stone walls for purposes of habitation under these shelters, and in the large deposits of débris on the cave floors are found their places of burial. Similar ledges or projecting cliffs are found in the limestone region, and were much used by the prehistoric people.

In Southeast Kentucky there are frequent evidences of burials in these shelters. This is true of Wolfe, Estill, Breathitt, Clark, Madison, and Morgan counties. At one time in these particular sections there must have been quite a large population, as these counties contain numerous stone graves and cave burials—a population which was induced probably not so much by the generousness of the soil as by deposits of flint, which were found, particularly in Wolfe County, with some degree of persistence. On one hillside in Wolfe County the writer examined flint quarries where vast quantities of spalls had been piled, and from the largest pieces of material of which had been made great numbers of arrowheads, which contained a combination of red and white in the flint.

MOUNDS AND MOUND BURIALS.

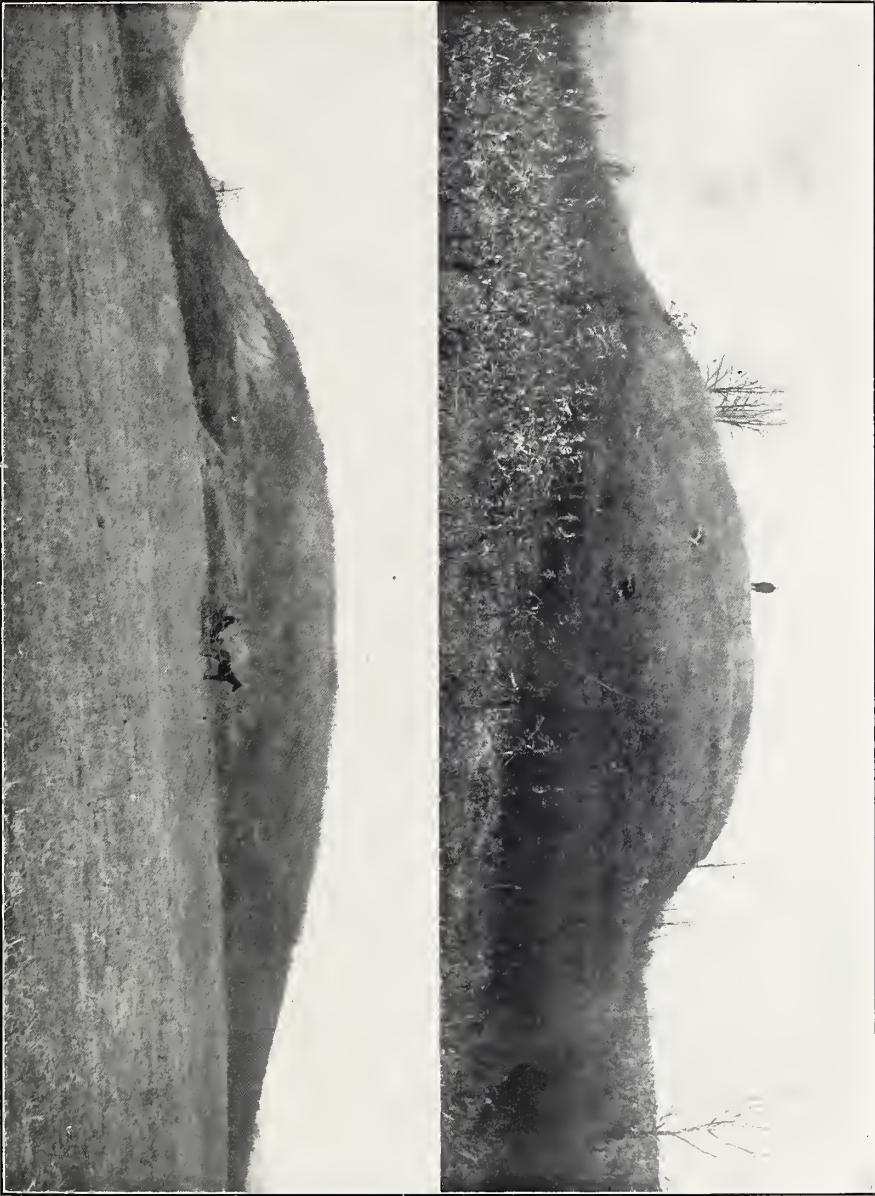
Kentucky has a border on the Ohio River of seven hundred miles. Beginning with the Big Sandy, and with smaller intervening streams, it is entered by the Licking, Kentucky, Green, Barren, Cumberland, and Tennessee rivers. In this State the rivers almost entirely run from the south to the north, thus piercing the State with a vast mileage of waterway, and enabling the people either of the remote or the present time to travel into all por-

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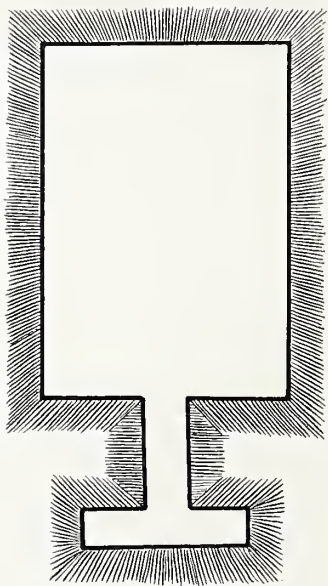
tions along these water lines. The prehistoric man availed himself of these conditions by the very necessity of his surroundings. If he transported anything of considerable bulk he was forced to use these streams as a means of journeying from one point to another. This doubtless had much to do with fixing their habitations along the river margins. Fertility of soil had much to do with where they lived, but second to this, water transportation controlled and determined the places of abode. Growing out of this fact, the prehistoric people, or those who erected the mounds, inhabited almost every portion of Kentucky, always being measurably controlled by the courses of the streams. And wherever these people came or lived we find, scattered in almost every county in Kentucky, earthen mounds. For a long time they were known as Mound Builders, and this nomenclature grew out of the fact that they were the architects of these structures. It is estimated that up to this day, notwithstanding the erosive effects of time on these mounds, constructed almost entirely of earth, there remain several thousands, the location, size, and contour of which may easily be determined.

As in many other things connected with these people, there was a difference in the way and the purpose for which these mounds were erected, and they have been divided by the authorities into classes. Perhaps the simplest and most satisfactory division is that suggested and used by Mr. Holmes, who classified them according to form, as conical, pyramidal, elongate, and effigy mounds.

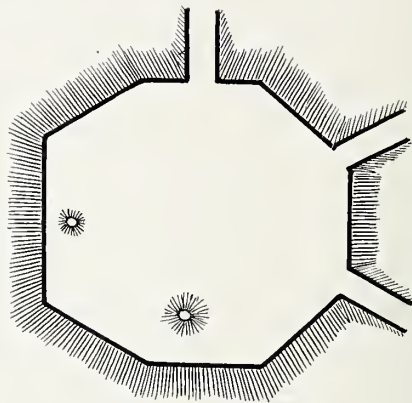
The great majority of mounds are of the conical form, small, and with an altitude of five to ten feet, though occasionally they reach a height of thirty or forty feet.



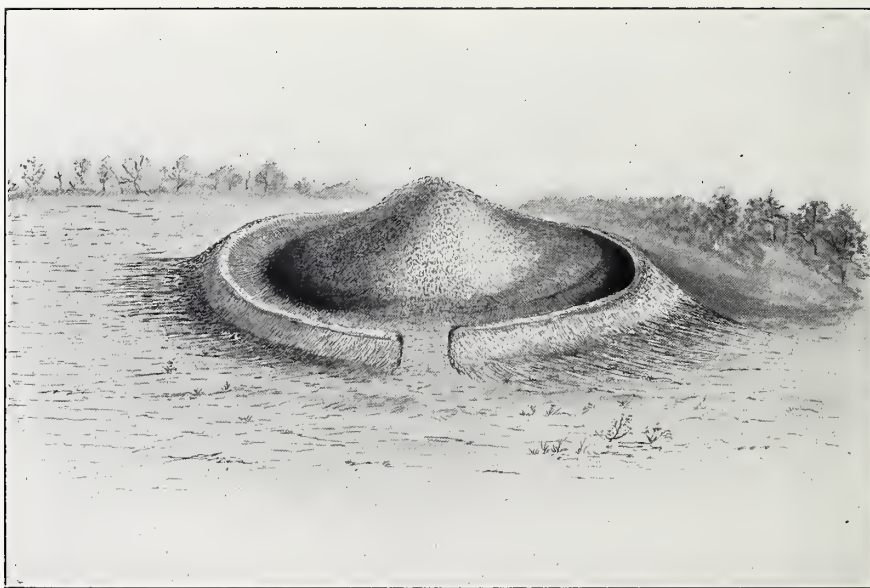
TWO MOUNDS NEAR OHIO RIVER, JUST EAST OF WARSAW,
GALLATIN COUNTY, KENTUCKY



MOUND
Mason County



OCTAGONAL MOUND
Woodford County



EARTHWORK ENCLOSURE
Greenup County. Reproduced from Collins' History

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The conical mounds are mere artificial heaps of earth, having the general form of a broad low cone, the outline of the base being circular or oval. Occasionally those of pear-shaped base are seen. These tumuli occur singly or in groups, sometimes isolated, but more frequently in connection with other works. Perhaps ninety per cent are mortuary, erected as monuments to commemorate the life and service of some distinguished person of the stone-age people.

The typical pyramidal mound is a large quadrangular structure with flattened top; yet some are circular or oval, some polygonal, but all are truncated or flat on top. The altitude of these occasionally reaches forty feet. They generally occur in connection with other remains, as enclosures, fortifications, village sites, or mound groups. The most striking examples of this kind are to be seen in Adair, Gallatin, Montgomery, Hickman, Fulton, Greenup, Woodford, Mason, Trigg, and Ballard counties.

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Occasionally elongate or wall-like mounds are seen, but the instances are few, and it is probable that these are not the typical elongate mound, but detached or outlying portions of a system of earthworks near which the few known occur. One of these wall-like structures is to be observed near the "Old Fort" in Greenup County, in connection with what is known as the Portsmouth Group. Near this wall is a small effigy mound, representing a bear. It is a curious fact—a fact maintained by the authorities—that this is the only mound of its kind south of the Ohio River short of Georgia.

As soon as people began to have time to consider these tumular remains there was much conjecture and argu-

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ment as to the purposes for which these several classes were used. Some said they were monuments pure and simple; others said they were places of burial, some places of refuge, others temples of worship. Shortly after these inquiries began to pass through the minds of the people who saw the mounds, investigation and research were set on foot.

Pioneers paid little attention to these mounds for many years. They were denuded of the forests which had grown up on their sides, and the plowshare was set to work as a destructive agent in eliminating their contour as well as changing their form. The demands of agriculture did not stop to inquire why these structures were builded. The great question was abundant yields of corn, tobacco, and wheat, not what lay beneath these earthen heaps with the hidden story of the past of a mysterious nation. It made no difference to the agriculturist whether in the bosom of the mounds lay buried the ancient dead, or whether upon its sides he had stood in defense of his home, or whether upon its crown, with never-dying fires, he had sacrificed to his gods. When the time of the antiquarian came, he stood in the presence of these mute witnesses of the past and asked, Where had the builders gone, whence did they come, why these structures? There were variant answers from those who undertook from the meager records to tell the story of the people who, so many hundreds of years ago, had builded them with a purpose definite enough to the builders, but which, through the lapse of ages, had become dim and uncertain to the interpreter of the nineteenth and twentieth centuries. It was no answer that, wherever the Mississippi and its tributaries had watered the earth

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with their currents these mounds are found, that they stand with sphinx-like form on the prairies of the West, upon the savannas of the Gulf, and along the productive valleys of the Ohio and the Licking, the Cumberland and Kentucky. Time has dealt gently with many of the larger mounds, but the people who builded them are nameless and their past is shrouded in almost impenetrable mystery. The watch-fires that once burned upon their summits are quenched and the ashes scattered to the four winds. Only these monumental heaps, without inscription, stand as silent sentinels to declare that the "Mound Builders" once lived, moved, and fought about these faithful guardians of the past; but they give no indication as to whither those have gone whose hands wrought and fashioned them.

The most distinguished form of burial among the primitive Kentuckians was that of the mound. The usual method was to place the bodies of the dead upon the surface of the earth with a covering of skins, cloth, bark, or stone, and then to erect over them earthen heaps varying in size according to the numbers and strength of the tribe or family of the dead, and the reverence and love they bore them. Some of these burial mounds measure thirty or forty feet in height, with proportionate base. It was commonly believed that all mounds were burial places. Explorations show that this is not so. The true pyramidal mounds are not so likely to contain burials, though intrusive interments are not infrequent. To erect many of these monuments to the dead would require great expenditure of labor and almost endless patience, as there were no means of moving the earth except in baskets and skins. A large mound that existed at Mt.

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Sterling, in Montgomery County, and which was cut down many years ago, had a height of over twenty feet and a diameter of more than one hundred at its base. It contained but a single skeleton, buried near the center. The rich deposits of relics of primitive art accompanying this burial proclaim the dead one of no mean rank among his people, while the immense amount of labor necessary to build his sepulchre speaks the love and veneration in which he was held, and that no outlay of time or labor was begrudged in erecting a monument which would proclaim to all generations his fame, to be a memorial forever of his greatness among the early men of Kentucky.

In August, 1897, the author was permitted to examine what is known as the Moberly Mound, in Madison County, six miles east of Richmond. As this was one of his earliest excavations, he was not able to remove the mound with as much care, skill, and patience as has marked subsequent explorations. This was a burial mound. It contained approximately three thousand cubic yards of earth, and it was calculated that it would have required one hundred men forty days to have erected this monument. It contained six burials, evidently made at the same time. Five of these were men, probably past the meridian of life. The sixth was a younger person, not more than twenty years of age. These six bodies had been laid upon the natural surface of the ground and over them had been placed cloth or skins of some kind, and on the top of this, earth, which had been brought a distance of two hundred and fifty feet. About three feet from the center line was a skeleton lying east and west, with head to the west. The skull was in a good state of preservation. The body was lying upon its back,

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face upward, hands lying close to the sides, feet straight out. The teeth indicated a man advanced in years, being much worn, two of the lower molars being gone. On the breast there was a beautiful grooved syenite ax, and beside it a scraper with a perfect edge which had been produced by a whetstone, and this whetstone lay close to the scraper. On the inside of the leg was a remarkable wound, which fixed the cause of death of this man whose remains we were so ruthlessly removing after his sleep of ages. In the shaft of the left femur was a large flint spearhead driven entirely through the bone. It required no wide sweep of the imagination to carry one back across the hundreds of years intervening between the construction of this mound and the present day, and to clothe in living forms the warrior and his companions, and to understand how, on the fateful day when he received the death-wound, he was engaged in combating with his country's enemies. He had not died by accident, but had come to his end by violence when in conflict with some foe quicker and more powerful than himself. The position of the flint spearhead in the bone showed that the struggle had been a very close encounter; that he and his antagonist, face to face, eye to eye, and hand to hand, had fought out to the death the contest which ended his life. It was apparent from the angle of the weapon in the bone that the combatants had been very close together, and that the Mound Builder who was wounded and died had fought a right-handed man. The size of the spearhead demonstrated beyond question that it could not have been driven from a bow, and that only a spear handle could carry it with sufficient force to cut through the flesh and bone; and the direction of the blow made it certain that at the time of the

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infliction of the wound the antagonists could not have been separated more than two or three feet. Probably the thrust had been directed at the heart, but in the encounter the aim of the antagonist had been diverted, and instead of striking the heart had glanced downward and passed through the bone of his leg, a short distance below and in close proximity to the femoral artery, inflicting an injury which caused death from loss of blood.

This unfortunate victim had been carried away by his comrades to this place of sepulture. From above his body were alternately removed layers of clay and black loam. These, in the form of a cube, continued for four feet above the body, being four feet in width and eight in length. Around him were found arrowheads and spearheads, and a bone from some fish similar to the gar. A piece of graphite was close to his right hand, and near by was found his pipe, made of clay. In order to render it more brilliant and beautiful, it had been most artistically and skillfully ornamented. It was a type of pipe which in clay is very rare and unusual, tubular in form, and the surface had been plated with a thin coating of mica, put on with great care and skill so as to form a complete covering. The brilliant effect of it in the eyes of the ancient Kentuckian, who knew the use of neither gold nor silver, would make it a thing of beauty. No electroplate of the present time could have given a more distinctive or artistic effect than this covering of glistening mica. White, red, and pink ochre in abundance had been arranged about this body, as well as the other five. Near by was an earthen vessel filled with red ochre of very fine quality, and so well was it preserved that if the man with whom it had been buried five hundred

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years ago had been resurrected, he would have found it ready for use for decoration in war or peace.

It was evident that all six bodies had been buried at the same time, as they were all on the same level, and that this monument which was so ruthlessly demolished by the writer had been builded over these nameless people in recognition of the valiant service which they had rendered for their country's defense. It may be that they had been borne from some distant battlefield to be given sepulture with those whom they loved or whom they had honored by their courage, or that on the fertile plain had been a great struggle in which these gallant soldiers had perished. Possibly victory had crowned their efforts, and so, close to the scenes of their heroism, they had been laid, and over their remains had been erected this mound to tell those in ages to come how they died and where reposed the ashes of the brave.

Mounds containing stone-cist burials similar to those of the stone-grave cemeteries occur largely in the southern portion of the State. These often contain numerous burials, the graves being arranged in layers or tiers, one above the other, and mounds containing as many as three tiers of graves are known.

In Christian County, ten miles east of Hopkinsville, a small mound- was explored several years ago which contained two stone-grave burials. It measured six feet in height by thirty feet in diameter. When cut down, the burials were encountered near the center, and were those of an adult of advanced years and a child. The elder person had been laid at length upon the surface of the earth, and about him a cist of rough stone erected. The earth was then heaped above the grave until the

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mound rose a foot above the top of the burial. Here the body of the infant, similarly enclosed in rough slabs of stone, was placed directly above the body of the adult, and the process of raising the mound continued until this grave too was covered with a foot of earth. Here a layer of charcoal and ashes, intermingled with bones of fish and game animals common to that section, together with fragments of pottery, indicated that when the mound reached this point fires were kindled upon its surface and funeral rites, perhaps a feast, held before the last stage of the mound was builded, which arose a foot and a half above the ashes.

The mounds of Union County were first systematically explored by the late Sidney S. Lyon, under the patronage of the Smithsonian Institution, the report of which for the year 1870 gives the result of his researches. Mr. Lyon, in a private letter, said of this region that he has seen the work of the Mound Builder in many States, but nowhere had he observed anything to compare in extent and importance with those at this point. "If the ash beds, bone heaps, *et cetera*, are evidence of a formerly populous and settled country, it is to be found here. In my examinations I found nearly one hundred mounds in an area of a hundred acres." A single group on Lost Creek, examined by Mr. Lyon, contained forty-eight tumuli.

What is known as the Lindsay Mound, on Buffalo Creek, four miles from Raleigh, explored by Mr. Lyon, revealed many interesting features in regard to burial customs. The bodies were placed in a circle upon their backs, with head directed toward the center and faces turned upon the left side, the arrangement being similar

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to the spokes of a wheel. There were no burials at the exact center of the mound. This circle of burials was extended toward the circumference by one or more additional circles. Above the lower burials were other tiers of graves, the mound on the west side containing as many as five layers. Three distinct kinds of burial were observed; first, those of the lower tier, which had been placed upon the natural surface of the earth, it having been first scraped clean of all vegetable matter. With these skeletons, the bones of which were so tender that they could not be removed, were found no vessels or implements of any kind, nor was there any indication that bark or any other substance had been used to cover and protect the bodies. These lower burials were covered with yellow sandy loam from a pit near by. Three or four superimposed layers of burials of a later date were covered with clay and accompanied by burial urns and other implements of prehistoric make. The third class of burials had been made by digging irregular holes or pits into the mound down to the original surface and depositing the bodies therein, and filling the excavation with earth. The mixed or discolored material in these pit burials revealed that they were intrusive, that is, made after the mound had been completed, but even they are of ancient date. In 1860 a large poplar tree standing on the margin of the mound was felled. The rings, which were counted at the time, indicated an age of two hundred and forty-nine years. A root of this tree over a foot in diameter ran across the mound, passing through the excavation of one of these intrusive interments, conclusively showing that this burial was of greater age than the tree. Mr. Lyon termed this mound "a

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common burial place, or burial place of the common people."

Interesting questions arise as we study the contents and structure of this mound. How are we to account for the three divergent methods of burials? Were the more ancient of the lower tier a different people from these of the upper? Had they no implements or vessels of clay, no conception of a future life where the spirit of the dead would require those things he most used in this life? Who were those of the intrusive burials, the friends of whom were willing to desecrate the graves of others to give them sepulture?

A mound near Uniontown contained the body of a man buried in a sitting posture, accompanied by numerous relics, among which were a beautiful notched flint implement twelve inches in length, three bi-concave discs of stone one and a half inches in diameter and one half inch thick, the margin being grooved, and each having a central perforation about which were arranged five smaller holes, a copper awl, a copper disc covered with woven fabric, and a pottery vessel.

Another mound contained three skulls without the bodies, and some parcels of bones which had evidently been dismembered before burial. A mound near Lost Creek, like the Lindsay Mound, showed a remarkable blending of different modes of sepulture. Many of the early burials were not enclosed in stone coffins nor accompanied by relics. Others were covered with stone slabs set on edge and inclined inward, meeting over the body, and enclosing it in a triangular or roof-shaped cist. Many vessels of pottery accompanied these remains. Six feet beneath the surface of the mound was a stone pavement

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made of rough limestone slabs weighing from twenty to one hundred and fifty pounds. This mound also contained intrusive burials. One occupied a pit five feet deep, in making which the skeletons or parts of skeletons of three bodies had been removed, and the intrusive interments made as deep as the third or fourth layer of original burial. The bones removed in making this grave were carelessly thrown into the grave above the newly buried body, but not in contact with it. Two copper bells, evidently of European origin, were found in this grave, and indicated that those who so ruthlessly cast aside the bones of the builders of the mound to make way for their own dead were Indians of the historic period who had come in contact with the Spanish or French traders, probably Shawnees, who were in the western part of the State as late as 1662.

Another mound explored by Mr. Lyon appeared to contain a vault or wooden chamber, from the presence of charred logs, some in an upright and some in a horizontal position. Remains of a similar wooden structure have been observed in a mound in Fulton County, and another in Bell County, in the southeastern portion of the State.

Mr. R. B. Evans, of Glasgow, opened a very remarkable mound in Allen County many years ago. It contained a well-like vault ten feet deep and eight feet in diameter, walled up with stone. The bottom was made of flat stones placed on edge close together, and keyed in with smaller stones. At every two feet in this vault was a layer of large flat stones, and between these were numerous human remains.

Pyramidal or truncated mounds are common over

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the greater part of the State. They are usually to be seen in connection with other remains, often occupying a central position within earthwork enclosures, or standing out conspicuously as the leading feature of a mound group. Though the typical pyramidal mound is rectangular in form, yet many have bases circular, oval, or polygonal. Some are broad and low, being rather raised platforms of earth than true mounds. Collins, in his "History of Kentucky," mentions a very remarkable example of this sort of structure in Ballard County, on the Ohio River bottoms opposite Mound City, Illinois. It has a base area of fifteen acres, and measures five or six feet in height. Upon one end is a conical mound forty feet in height, containing half an acre, and in the center of this big mound field rises another mound twelve feet in height. One in Montgomery County has an inclined way leading to the top, and a mound in Gallatin County (see page 33) has traces of a similar approach, apparently designed to afford means of easy ascent to the summit. Excellent examples of the rectangular pyramidal mound occur in Fulton County on the Bayou de Chien, five miles east of Hickman. One of these measures eighty-five by fifty feet, and is twenty feet high, the sides being very abrupt. Others appear within an old fortification in Ballard County, on the Punckney Bend Road south of the mouth of Mayfield Creek, still others in Marshall County on Jonathan Creek. On page 34 are illustrations of two very unusual forms of the truncated mound. These cuts are redrawn from "Monuments of the Mississippi Valley," Smithsonian Contribution Number One, and are from surveys made by Rafinesque in 1818. The upper mound, or rather terrace, is described by Rafinesque as being located

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near Lovedale, in Woodford County. "It is octagonal in form, measuring one hundred and fifty feet on each side. It has three graded ascents, one at each of the northern angles, and one at the middle of the western side. It is but little more than five feet in height. Upon it are two conical mounds, as shown in the plan, also the dwelling house of the proprietor." This, one of the most remarkable remains ever discovered in Kentucky, has unfortunately been practically destroyed by cultivation, and the most diligent inquiry fails to locate Lovedale, but investigation throughout Woodford County shows that long since practically all visible traces of this wonderful structure have been eliminated. On the same page is shown another extraordinary mound, and Squier and Davis say of it: "The plan of this mound or terrace sufficiently explains its character. It is situated three miles from Washington, Mason County, Kentucky. Its height is ten feet." This was also from Rafinesque's Manuscript, 1818.

In Greenup County, near the Old Fort earthworks, in connection with the Portsmouth Group is a small effigy mound representing a bear, and the only well-defined one of its kind in the State. With the exception of two in Ohio, including the noted serpent mound, and two bird mounds in Georgia, it is said there are no others outside the Wisconsin district. The proximity of this mound to those in Ohio would show that there was some tribal or social intercourse between the people on the south side of the Ohio River with the people on the north side, and scientists have been puzzled by the appearance of this unusual structure at the point where it is built. Mr. T. H. Lewis, who was the first to observe this structure,

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and so far as the writer knows the only one who had published an account of it, describes it as follows: " This effigy probably represents a bear which seems to be leaning forward in an attitude of observation. It is not very large, being but fifty-three feet from the top of the back to the end of the foreleg, and its utmost length is one hundred and five and one-half feet from the tip of the nose to the rear of the hind foot. The greatest vertical height is at the fore-shoulder, where it is three and one-half feet. . . . The bear effigy described here has never been mentioned in print before and seems to have escaped the notice of inquiring scientists—indeed it was unknown even to the residents of the neighborhood. Its value is mainly in that it was the first imitative mound constructed of earth discovered south of the Ohio River, and that it is an important addition to the scanty list of such works already brought to light in Ohio, the nearest of which is but a few miles away from this one, being the peculiar three-legged animal (in profile) on the Scioto River just above Portsmouth, surveyed by Colonel Whittelsy in 1846 and mapped in 'Ancient Monuments.'"

One of the most unusual mounds in Kentucky is on the farm of Mr. Wilson Tate, near Moberly Station, on the railroad between Richmond in Madison County and Irvine in Estill County, and close to the turnpike connecting these two towns. It is one hundred and ninety-two feet in diameter and fifteen feet high. It is surrounded by a moat thirty-five feet in width and ten feet in depth, and the indications are that this moat was once filled with water. Although a part of this moat has been plowed over for fifty years, it still retains its form. The writer ran a trench eight feet wide into the mound, beginning

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on the western side, to its center, and found nothing but a spearhead about three inches long. Occasional beds of charcoal were widely distributed, but nothing could be argued from their presence. The earth had been taken from the trench or moat surrounding the mound, and on the outside of the moat had been thrown up an embankment some two or three feet in height. The soil did not indicate, except in one spot, that it had been constructed for burial purposes. From a cursory examination of the excavation one would be unable to determine the purpose for which this mound had been erected, whether for the protection of the surrounding people from sudden invasion, or as a residence of some great chieftain.

A similar mound was formerly to be seen in Greenup County in connection with the Portsmouth Group of earthworks. It consisted of an embankment of earth five feet high by thirty feet base, with an interior ditch twenty-five feet across by six feet deep, enclosing an area ninety feet in diameter, in the center of which rises a mound eight feet high by forty feet base. A narrow gateway through the parapet and causeway over the ditch leads to the enclosed mound. A sketch of this mound will be found on page 34.

Kentucky was abundantly supplied with mounds, as before stated, along the streams, and these reach almost every county in the Commonwealth. The ordinary conical mound excites no surprise. Oftentimes it was not sufficiently elevated to attract unusual attention. As these mounds occurred in the valleys, where the best land was found, they readily became the prey of the plow-share, and long before their value scientifically and historically was fixed at all, the vast majority of them had

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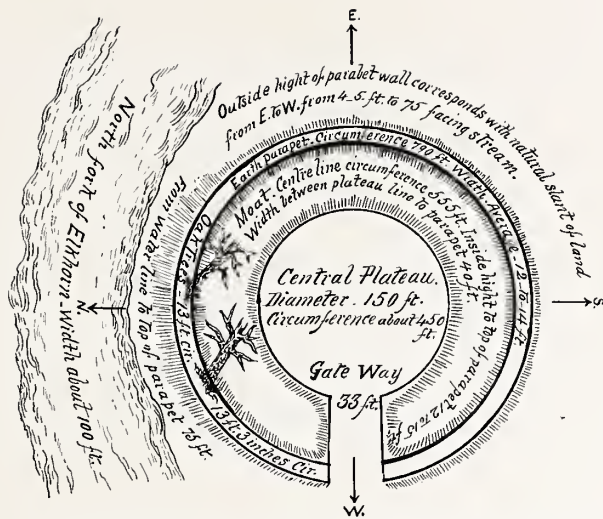
been substantially destroyed, or at least so far changed as to affect their value from a scientific viewpoint.

Among the Central Kentucky counties there are more well-preserved mounds in Madison County than any other. Around Berea, Kirksville, along Silver Creek, and along the line of the railroad leading from Lancaster to Richmond are found numerous and well-preserved specimens, among the very best in the State. The earth in these localities is largely yellow or red clay, and this, together with the vegetation which readily grows upon this character of soil, has preserved these mounds in a very remarkable way.

It would be impossible to describe in detail every mound structure in the State, or to accurately locate all of them. It would require much more space than the limits of this publication will justify, and we shall therefore be content with giving the forms or divisions into which these mounds have been placed. Those interested in this subject can readily, in their own locality, examine and investigate all these structures, and with the general discussion of the plans and uses of these mounds determine the purposes for which they were used.

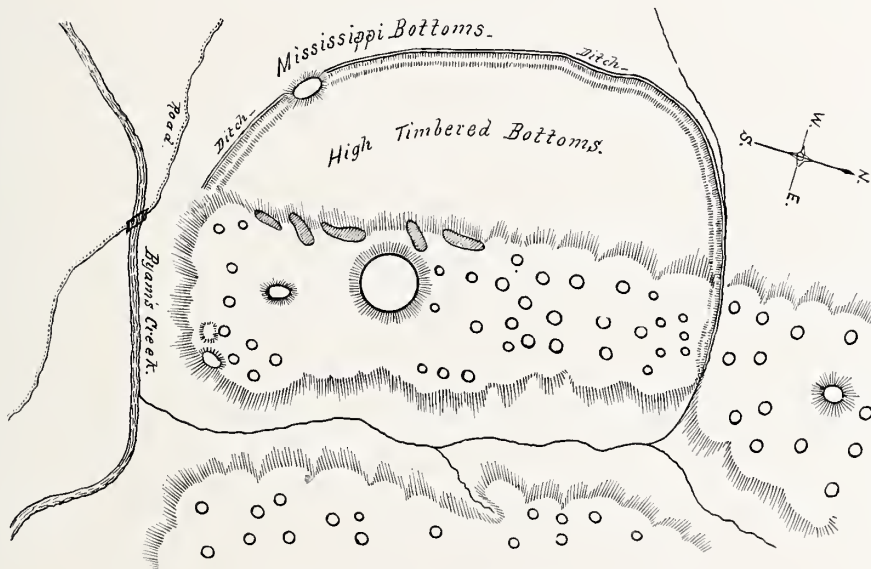
EARTHWORK AND STONE FORTIFICATIONS AND ENCLOSURES.

In the use of earthworks for the purpose of fortification the prehistoric people of Kentucky exhibited a fair degree of engineering skill and great military acumen. The points selected were usually of strategic value and evinced, when we consider their advancement along other



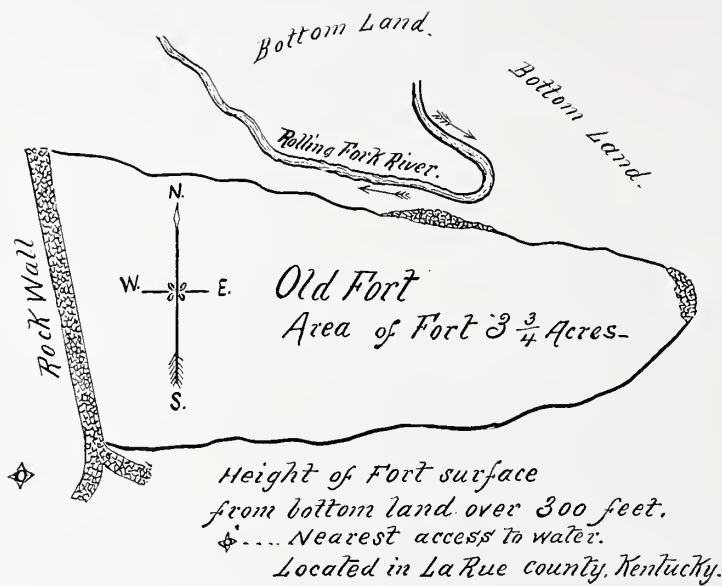
*Location Newtown turnpike on land of Mis. Brant 6 1/2 miles
N.N.E. from Lexington - formerly part of the Moore farm -*

EARTHWORK—FAYETTE COUNTY

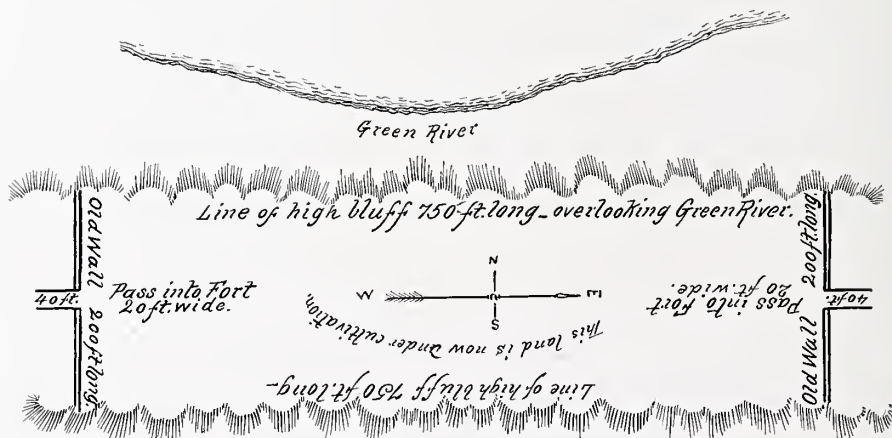


O'BYAM'S FORT—HICKMAN COUNTY

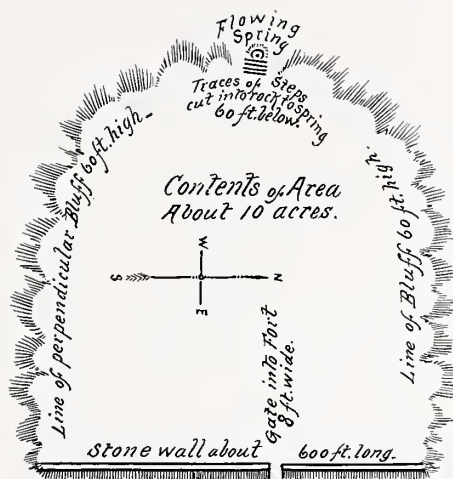
After Thomas



STONE FORTIFICATION—LARUE COUNTY

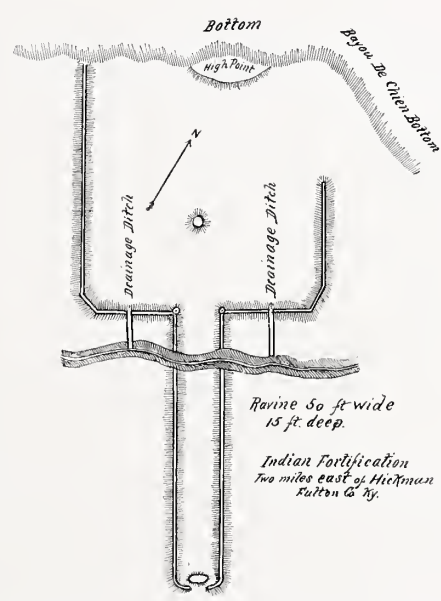


FORTIFICATION—WARREN COUNTY

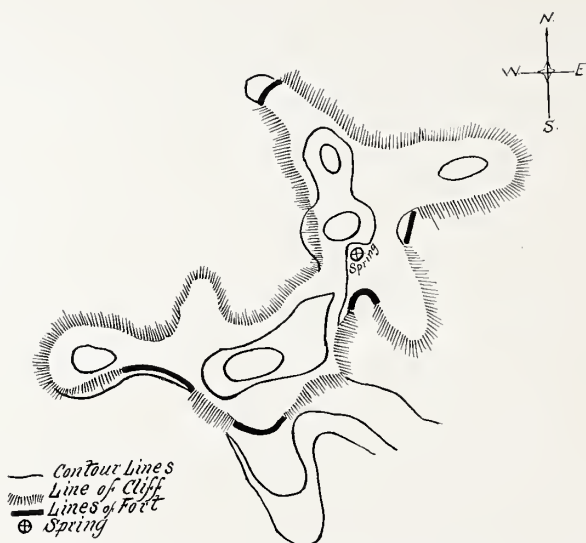


*Ancient Fort
Near West Fork of Dondelson Creek
S.W. part of Caldwell Co. Ky.*

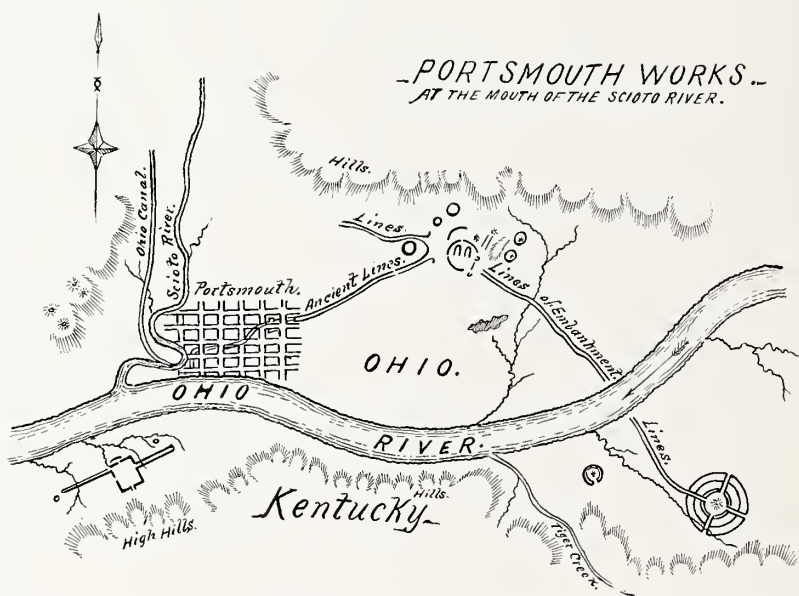
FORTIFICATION—CALDWELL COUNTY



FORTIFICATION—HICKMAN COUNTY



Indian Fort Hill, near Berea, Ky.



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lines, an astonishing knowledge of the art of war. The late J. R. Proctor, of the Shaler Geological Corps, in writing of the fortifications along Green River, quotes the opinion of an acknowledged master of the military art in regard to one of these remains. "General Buell," he says, "who has been a resident of the Green River country for several years past, expresses the opinion that the Mound Builders exhibited a fine knowledge of defensive warfare, both in the selection and in the manner of fortifying the hill [Indian Hill] at the mouth of Bear Creek." A fortification on a spur of bluffs near the Punckney Bend Road south of the mouth of Mayfield Creek, in Ballard County, shows that these people understood the principle of constructing bastion-like extensions in the parapets of their fortifications so as to be able to deliver a cross-fire on the attacking force.

A peninsula formed by a horseshoe bend in a river, surrounded by precipitous bluffs, or a sharp spur with abrupt sides running out from high bluffs, were favorite places for the erection of fortifications. This was usually done by throwing up a line of earth or stone embankments from cliff to cliff across the narrow neck of the river bend, or where a projecting spur or promontory was the site to be strengthened, by constructing an embankment and ditch at its junction with the mainland. As a rule earth was used in forming these walls, but there are a number in the State made of stone. Sometimes moats were dug in front of the parapets, and occasionally these occur both within and without the walls. The present condition of some of these moats shows that they were dug to considerable depth, probably as much as fifteen feet, having a width ranging from fifteen to thirty feet. In Central

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Kentucky a clay, which forms so large a part of the soil, would render it easy to make them watertight. Here and there are evidences that a drawbridge or movable span was used in crossing the moat to the inner part of the fortification, but these are merely indications, and there is no absolute certainty as to the actual modes of ingress and egress. Examples of this method of fort-building are to be seen in Hickman, Fulton, Barren, Allen, Boone, Bourbon, Edmonson, Green, Hopkins, Caldwell, Larue, Madison, and Warren counties. Unfortunately many of the remains in these and other counties, by the constant wear of the plow, are being rapidly effaced, while some have entirely disappeared. But here and there are examples, remarkably well preserved, and if untouched by the inroads of agricultural cultivation will stand for centuries to come as memorials of a general and protracted struggle for the possession of Kentucky, long before the white man crossed the Alleghany Mountains or even saw the shores of the Western World.

Some forts were made by a complete surrounding wall of earth or stone, where the topography of the land did not eliminate the necessity of fortifying one or more of the sides. Many earthen enclosures, by their location, size, and structural characteristics, indicate that they were not designed as places of defense, and we can only conjecture as to the purpose of the ancient Kentuckian in erecting them. Some have been termed ceremonial or religious enclosures, because of the part they are supposed to have played in the tribal life of these people. It is not the writer's purpose to attempt to describe or even locate all of the ancient fortifications and enclosures known in Kentucky, but rather to point out and describe a few

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that will serve as types of methods of defensive warfare practiced by these people.

On page 51 is a sketch of what is known as O'Byam's Fort, in Hickman County. The drawing is made from one in the work of Doctor Cyrus Thomas on "Mound Explorations," published in the Twelfth Annual Report of the Bureau of Ethnology. The following description is also taken from that work: "The fort is, as is usual in this region, upon the best position for defense in that immediate section, being located on the extreme point of a bluff some fifty feet high, and almost vertical at its southern end. It consists of an enclosing wall and ditch, mounds, excavations, and hut range. The length of the wall and ditch from end around to end, following the irregular curve, is about eighteen hundred feet, and there is no wall along the steep bluff facing east and south. Of these outlines the southern end is so steep as to render ascent impractical. The eastern slope is almost equally so. The northern line was well defended by embankment and ditch, and for the remainder of the circuit the embankment follows the edge of the high bottom."

A remarkable specimen of stone fortification is found in Warren County, twelve miles north of Bowling Green, on the south bank of Green River. It covers a bluff practically in the shape of a parallelogram, seven hundred and fifty feet on either side. These precipitous bluffs afford complete protection on the north and on the south. Across the ridge were built two stone walls, making a complete defense at either end. These walls are about two hundred feet in length, with an opening or gateway of twenty feet near the middle. The top of this ridge is an open field, and has been under cultivation for many

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years. The walls have been torn down, but a small part of them is left, and the location is distinctly marked. The lines can be traced without difficulty, although it is probable that more than five hundred years have passed since this fort was used for the protection of those who inhabited Kentucky at that time. Facing the entrance of the fort there was a line of mounds continuing for nearly a mile in distance, the mounds being largest near the fort and decreasing in size as they receded. Through the kindness of Honorable B. F. Proctor, a prominent attorney of the Bowling Green bar, who visited the fort in the past few weeks, the writer is able to present on page 52 a sketch of this work.

The sketch on page 53 is an approximately accurate representation of a fortification in Caldwell County near the west fork of Dondelson Creek. This fort enclosed an area of about ten acres of ground. It had a frontage upon the neck of land where the stone wall is constructed of about six hundred feet. The bluffs on either side are at least sixty feet high, and were practically impregnable. It had a single gate facing east, eight feet wide. Large stones were used in the construction of the wall, and they must have been brought from a considerable distance. A portion of the walls still exists, in a reasonable state of preservation. Originally the stone parapet was between six and seven feet high, and garrisoned by sufficient men it would have been impossible for any troops, armed as the men of that period were, to have forced an entrance. The narrowness of the gateway is an assurance that it was built with an eye to fierce defense. It is also unusual by reason of its supply of water. On the west side is a never-failing flowing spring, and traces of steps cut into the

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rock to the spring below are still discernible. The area of ten acres would have given sufficient space for the accommodation of quite an army of people, and with the exception of the fortification on Indian Fort Mountain this particular place is among the best constructed and most carefully built within the limits of the State.

Another remarkable stone fort in a reasonably good state of preservation is found in Larue County, about six miles from Hodgenville, on the banks of Rolling Fork River. (See drawing, page 52.) This fort included an area of three and three fourths acres. It is now covered with heavy forest. In its shattered and broken condition it yet gives evidence of advancement among these prehistoric people in the art of fort building. It was situated on a bluff three hundred feet high, either perpendicular or partially overhanging the river below. Its elevation gave it a position from which a splendid lookout could be maintained for miles around. Some distance away, immediately west of the fort, was a spring, which, however, could not be reached except by leaving the fort and going a short distance into the open. An examination shows that the rock wall, which was the real protection of this fort, had no gateway or entrance. Behind the wall was a ditch. The remains of the wall at this time show a structure four and one half feet high, with a base of fifteen feet. At the south end of the stone wall are two curious wing-like projections. The length of the main wall across the neck of the fortification is three hundred and sixty-three feet. The two wings at the end, which are shown in the illustration, are each forty-nine and one half feet. At two points the natural defenses were strengthened by stone work,

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and all in all there is no stone fort in Kentucky that presents more painstaking preparation or more careful construction for efficiency in defense.

In Green County, two and one half miles from Greensburg, is another remarkable fort, on Pittman's Creek. The point here selected is what is called The Narrows, close to a pioneer station called Pittman's Fort. A bend of Pittman's Creek here includes an area of two hundred acres of land. At what is known as The Narrows, or neck of the bend, there was only a few feet of level land, and this was hemmed in on either side by great precipices. Across this neck of land walls have been constructed. The fall in the creek at this point is quite abrupt. In 1826 Doctor N. H. Arnold cut a channel across the neck and erected a mill; this channel was the race through which the water passed, and the mill has not yet been abandoned.

In Allen County, thirteen miles west from Scottsville, between that place and Bowling Green, is another remarkable remains of a fortification. It is described in Collins' "History of Kentucky" as follows:

"At this place the Middle Fork of Drake's Creek makes a horseshoe bend, running one mile, then with gradual bend returning to within thirty feet of the channel, where the bend may be said to have commenced. The partition which divides the channel of the creek at this point is of solid limestone, thirty feet thick at the base, two hundred yards in length, twenty feet high, and six feet wide at the top. The top is almost perfectly level and covered with small cedar trees. The area included within the bend of this creek is to the east of this narrow pass, and contains about two hundred acres of land rising from the creek in a gradual ascent of one hundred

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feet, where it forms a bold promontory. The top of this is level, and forms a square area containing about three acres enclosed with walls, and a ditch. The outer ditch is still perceptible and the walls are now about three feet high around the whole circuit of the fort. In the rear of this are to be seen many small mounds."

There is said to be another stone fortification in the southern part of Hardin County. The care, skill, and labor expended in these stone fortifications show that in those prehistoric days the wars were real, that the conflict between the parties who built the fort and those on the outside must have been long and fierce. How these struggles ended we can not tell. These fortifications all bear a striking resemblance to each other and show that they were probably erected by the same tribe or nation, and that they were not used so much on the border of Kentucky but farther back in the interior, and suggest that there had been an incursion or approach from the north toward the south, and that this line of forts was most likely part of a system built along a borderland in which brave defenders made gallant resistance to the encroachments of the foe who were driving them away from the Ohio.

The description of these forts will give some definite idea not only of the frequency of such works, but also of the necessities which called forth, from the people who used them, such heroic and skillful preparation for resistance to their foes.

On page 53 is a drawing of an ancient fortification near Hickman, in Fulton County. This is taken from the report of the Kentucky Geological Survey on the Jackson Purchase Region, by Doctor R. H. Loughridge, whose description the writer adopts:

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"This is located or situated about a mile northeast of Hickman, a short distance from the railroad, on the north side of the bluffs of the Mississippi and Bayou de Chien bottoms. These bluffs are here about seventy-five feet high, and quite abrupt, and gradually slope eastward for a short distance to a flat area, which is indicated by a branch or deep ravine running northward to the Bayou de Chien. The sketch represents a large enclosure of about two acres, extending southeastwardly nearly to the branch, where it is abruptly narrowed for six hundred feet further. The low elevation that borders it on the south for about five hundred feet is now partly plowed down in the cultivated field that lies along the bluff, and is somewhat broken in the flat, until it turns northeastward, where it is very prominent. While it would in itself be scarcely recognized as a line of earthworks by any person passing over it, yet when the other and prominent lines are followed and outlined, its own connection is clearly seen. Its course is N. 50 W. or parallel with the other sides, and has a width of ten to fifteen feet, much worn away by drainage of the slope. When near the branch it turns due east for about thirty-five feet, and then N. 40 E. for about one hundred and eighty-five feet to a mound somewhat higher. On the north side of the enclosure another line of earthworks appear, parallel with the one on the south, but beginning about half way between the bluff and branch. It is very regular and unbroken for about one hundred and ninety feet, when it turns S. 60 E. for nearly fifty feet, and thence S. 40 W. for about one hundred and ninety feet to another mound within about ninety-five feet of the former one. This ridge is also prominent and broad. The mounds are about twenty-

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five feet in diameter and from them two parallel lines of earthworks turn S. 40 E. six hundred feet. They are high and wide, and lying as they do in a flat cultivated field are very prominent. Their width is about twenty feet. On the southeast they turn toward each other and terminate, leaving an opening of about twenty-five feet. This is protected on the interior by a large mound forty by thirty-five feet, and higher than the earthworks, leaving but a very narrow opening. . . . For drainage purposes apparently a deep and narrow ditch was dug from either corner of the large enclosure to the branch. This fortification was admirably planned for defense. The large enclosure was presumably occupied by the tribe as a habitation, for fragments of pottery are very abundant, especially near the top of the bluff. It was well protected by the steep bluffs and by the earthworks against small forces, but in an emergency or against overwhelming numbers the tribe could retreat into the narrow enclosure, and with a deep ditch at one end and a protected gateway at the other, could better defend themselves."

The same writer describes another ancient fortification upon a spur on the south bluff of Sandy Creek two miles south of Laketon in Ballard County, and another upon a spur of bluffs near the Punckney Bend Road south of the mouth of Mayfield Creek in Ballard County. The latter is particularly interesting in that one line of its embankment presents an irregular front, the irregularity being caused by three bastions, or extensions, each about ten feet wide and reaching out respectively nine, eighteen, and nine feet, their front and sides and also the front of the embankments between them being quite steep. This structure clearly shows that these people possessed

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considerable skill in the art of defensive warfare, and that they knew the great advantage and demoralizing effect of a cross-fire upon an attacking force.

In Greenup County, at a point about a mile and a half below Portsmouth, Ohio, and nearly opposite the old mouth of the Scioto River, are to be seen the remains of the most interesting of the ancient earthworks of Kentucky. These were first brought to public notice in 1791 by Major Jonathan Hurt, then stationed at Fort Harmar, who in a letter to Doctor B. S. Bardon, of Philadelphia, bearing date of January 6, 1791, speaks of ancient remains being found "along the Scioto at its junction with the Ohio, opposite which on the Virginia side are extensive works, which have been accurately traced by Colonel George Morgan." These remains were described and mapped by Caleb Atwater, whose account appeared in the first volume of the Transactions of the American Antiquarian Society, published in 1820. E. G. Squier and D. Morton resurveyed them in 1846 and discovered features which had been overlooked by Mr. Atwater. These works also received the attention of Rafinesque as early as 1820. In 1887 Mr. T. H. Lewis resurveyed these imposing remains, and discovered that there were earthworks belonging to the series not noted by Mr. Squier, the most interesting of which was an effigy mound representing a bear. On page 54 is a sketch of these earthworks made from the survey of Mr. Squier and published in the Smithsonian Contributions, Volume I. The principal work upon the Kentucky side is a square enclosure with two lines of outworks consisting of parallel walls, opposite the mouth of the Scioto River. The following account is taken from "Ancient Monuments": "The sin-

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gular work occurs on the Kentucky side of the Ohio River opposite the old mouth of the Scioto, about two miles beyond Portsmouth. The territory on which it is situated is lifted some fifty feet above the first bottom, and extends back to the hills, which at this point are some distance from the river. It is much cut up by ravines and is quite uneven. The main body of the work is situated on a very beautiful level ascent to the east; the wings are on equally beautiful levels except that they are broken at two or three points by ravines. The principal work is an exact rectangle eight hundred feet square. The walls are about twelve feet by thirty-five or forty feet base, except on the east, where advantage is taken of the rise of the ground so as to lift them about fifty feet above the center of the area. . . .

“The most singular features of this structure are its outworks, which consist of parallel walls leading to the northeast and southwest. They are exactly parallel to the sides of the main work, and are each twenty-one hundred feet long. Some measurements make them of unequal length, but after a careful calculation of the space occupied by the interrupting ravines they are found to be nearly, not exactly, the same length.

“The parallel to the southwest has its outer wall in line with the northwest wall of the main work, and starts at thirty feet distance from the same. It is broken by a deep ravine near its extremities, which is probably four hundred or five hundred feet wide. Crossing the ravine the walls, traces of which are seen on the declivity, continue some distance, and then curve on a radius of one hundred feet, leaving a narrow gateway eight feet wide in the center. Converging walls start from the point

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of curve, but lose themselves after running three hundred and forty feet without meeting. Just beyond and a little to the right on the plain are two mounds, also a small circle one hundred feet in diameter, the walls of which are two feet high. The parallel, to the northeast, starts from the center of the main work, and is similar to the one already described, save it is not terminated by converging walls and there are no mounds beyond. It is interrupted by two ravines, the walls running to the very edges. The left wall of the parallel points to a right angle as it approaches the main work. To the left of this parallel, four hundred and fifty feet from a point eight hundred feet distant from the main work, on a high peninsula or headland, is a singular redoubt. . . . The embankment of the work is heavy and the ditch deep and wide and interior to the wall. The bottom of the ditch to the top of the wall is twelve to fifteen feet. The enclosed area is only sixty feet wide by one hundred feet long. It has a gateway from the northeast ten feet wide, outside of which, in the deep forest, is the grave of one of the first settlers. The object of this enclosure it is difficult to divine. If a place of burial, as has been suggested, properly conducted excavations would disclose the fact.

“A like wall of some one hundred paces in extent runs from the left-hand entrance of the main work along the verge of a declivity, terminating at the western angle. On this side are also three mounds, each about six feet high, formerly much higher, having been greatly reduced by the plow.

“From the western angle a deep gully runs off to the river. It has been mistaken by some for a causeway, entering the main work. The greater part of the lower

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parallel and portion of the upper one are open cultivated grounds. The walls of the main work are so steep as to preclude cultivation, and now form the fence lines of the area, which is fifteen acres. The area of the parallel is ten acres each; total thirty-five acres. Between this work and the river are traces of modern Indian encampments, of shells, burned stone, fragments of rude pottery, also some graves. This was a favorite spot with the Indians for various reasons, one of which is its proximity to the noted saline spring or deer lick known as McArthur's Lick. From the size of the walls, their position, and the circumstances, it has been suggested that this was a fortified place. For palisades it would certainly be impregnable to any savage. If designed as a sacred place, its sloping area would be most fit for the observations of sacrifices or ceremonies. What might have been the purpose of the mysterious parallels is more than we can at this period venture to say."

The other group upon the Kentucky side lies farther up the river. "It consists of four concentric circles placed at irregular intervals in respect to each other, and cut at right angles by four broad avenues, which conform in bearing very nearly to the cardinal points. A large mound is placed in the center. It is truncated and terraced, and has a graded way leading to its summit." Rafinesque, who visited these ancient works prior to 1820, observed about eight miles of parallels, giving to the parallels sixteen miles of embankment, and including the walls of the entire series a grand total of upward of twenty miles. For fuller accounts of these remarkable remains reference may be had to Collins' "History of Kentucky," "Ancient Monuments of the Mississippi Valley," by Squier

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and Davis, and the "Old Fort Earthworks," by T. H. Lewis, published in the Third Volume of the American Journal of Archeology.

It is impossible to tell why these complex and elaborate earthworks were constructed. The quadrangular structure might possibly have been designed for defensive purposes. By placing palisades on the wall near the south angle where it intersects the spur enclosing the opening, it could be successfully defended against any force, armed only with the weapons in use at the time these embankments were raised. The fact that trenches or moats are entirely lacking in connection with this fort and its parallel ways suggests that it was not designed for defensive purposes.

It would not be possible to print a full description of the earthen mounds and enclosures which were originally found in Kentucky. It will rather be more desirable to give some description of the present existing ones which best retain their original forms and contours. The best preserved enclosure in Kentucky at the present time is one located on the Newtown Turnpike, in Fayette County, on the land of Mrs. Brand, north and northeast from Lexington six and one half miles, on a part of what was formerly known as the Moore farm. The writer visited these remains in December, 1909, accompanied by Honorable James H. Mulligan, of Lexington, and Professor H. Stahl. It is on the banks of Elkhorn Creek. This stream flows at its base, and it is seventy-five feet from the water line to the top of the embankment. The outside of the embankment has a circumference of seven hundred and fifty feet, with an average width of twelve to fourteen feet. Immediately inside of the embankment is a moat. The

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moat at this time is from twelve to fifteen feet deep, and the circumference along the center line of the moat is five hundred and fifty-five feet. The distance between the raised elevation inside and the embankment is forty feet. The central elevation has a diameter of one hundred and fifty feet, with a circumference of four hundred and fifty feet. There is a gateway thirty-three feet wide, which had been raised at the time of the construction of the moat. On the embankment, and growing out of it, are two oak trees, one thirteen feet and the other thirteen feet three inches in circumference, thus indicating an age on the embankment of at least four hundred years.

Time has dealt most gently with these remains. The embankment is practically intact. The moat is not filled up more than three or four feet, and the central enclosure has not eroded at all. It is now covered with a second growth of timber. On the embankment there are indications of a growth of timber preceding the present one, and judging from appearances the timber which had fallen had an age of several hundred years, and this growth had been prior to that which is now found either upon the central enclosure, in the moat, or upon the embankment. In all questions of the ages of structures it is difficult to determine with exactness the period of construction, but all the conditions which surround this one demonstrates with certainty an age of five hundred years. The drawing on page 51 will give an exact and definite idea of the proportions and lines along which this earthwork was constructed.

Honorable James H. Mulligan, when a member of the Kentucky Legislature, proposed that the State should

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purchase this remain and make it a public park, together with a reasonable amount of ground in proximity to it. As Fayette County and Lexington have always exhibited a very high degree of public spirit and enlightened progress, it is hoped that in a few years this tract of ground, or the field which contains it, will be purchased by the county of Fayette and the city of Lexington and used for public purposes, so that at least one of the great earthworks of Kentucky, constructed with such beautiful and symmetrical proportions, may be preserved for all time to come. Thickly set with bluegrass, with clay embankments and gate, it is an earthwork that may be preserved in its present state, with a slight degree of care, for thousands of years to come.

Near this and between it and Lexington there are still distinct remains which must have been a fort of very considerable extent. This is well described in Collins' History, from which we quote: "The shape of the area is not unlike that of the moon when two thirds full. The dirt from the ditch enclosing this area is thrown sometimes out, sometimes in, sometimes both ways. There is no water within one hundred yards of this work, but there are several very fine springs two hundred yards off, and the North Elkhorn is within that distance northeastwardly. An ash tree was cut down in 1845, which stood on the bank of this ditch, which upon being examined proved to be four hundred years old. The ditch is still perfectly distinct throughout its whole extent, and in some places it is so deep and steep as to be dangerous to pass with a carriage." Fortunately a portion of this work has been included in a bluegrass pasture which has never

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been cultivated, and at this date, December, 1909, the lines of this embankment can be traced for quite a distance.

The best types of these circular enclosures are found in Fayette, Montgomery, and Madison counties. Silver Creek, in Madison County, seems to have been a favorite place not only for the construction of mounds for habitation, but also for the erection of enclosures and ceremonial structures. Three of these can be found within a distance of three miles on Silver Creek—two of them on the land of Mrs. Fred Ferris, eight miles from Richmond, near a post-office called Ruthton. They are both remarkable products of the prehistoric age, and one of them is practically untouched and uninjured. These two structures lie on the north side of Silver Creek, and with the exception of the circular enclosure on the North Elkhorn in Fayette, there is no earthwork better preserved in Kentucky than the smaller one of these. It was built on the spur of a hill coming down toward Silver Creek and nine hundred feet from the water line, with an elevation of probably fifty feet above the stream. On the west side was a steep slope, on the east side another slope, while on the north side it was only lifted about four or five feet above the original surface, and on the south side there was a descent to Silver Creek.

Squire Boone, a brother of Daniel, in passing down Silver Creek noted the fine location of this particular point for a mill site, and told his companions it would be one of the best of such sites in Kentucky. In the early pioneer days a mill was erected by James Bogy at this place. He patented the land and died some time early in the Nineteenth Century, and chose the middle of the

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smaller of these structures for a family burying-ground. The larger structure consists of an embankment six hundred and sixty-three feet in circumference. Inside of this is a moat or ditch. The height of the embankment has an average of four feet, the ditch a depth of from four to six feet. The width of the wall at the base is thirty-six feet, the width of the ditch forty feet. This ditch had evidently been filled up several feet by decaying vegetation and by erosion. The diameter of the inside plateau, or space surrounded by the ditch, is one hundred and thirty-five feet. These structures are only about four hundred feet apart. The second is smaller but retains its form more perfectly, and is a splendid demonstration of the symmetry with which these enclosures were laid out. It consists of an earthen embankment thirty-six feet in width. Inside of it is a ditch twenty-one feet wide, with a present depth of ten feet. The circumference of the embankment is four hundred and fifty feet. Inside of the ditch is a raised space with a diameter of seventy-five feet. This is covered now with a perfect sod of bluegrass, and trees are growing upon it which show an age of one hundred and twenty-five years. The Bogy family, who patented this land, recognizing the splendid situation of this prehistoric structure and the symmetrical form of the plateau inside the ditch, with its seventy-five feet of diameter, appropriated it for a family burying-ground. These burials began in the Eighteenth Century and continued down to 1850. Every available space in the circle has been occupied by these intrusive burials. White and colored pioneers were here laid side by side. The original settler, Mr. James Bogy, must have been a man of large proportions. The length

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of his grave, compared with other graves, shows that he was fully seven feet in height. It is a tradition among the people of Madison County that he was one of the very largest pioneers who came as settlers to Madison County in the early period of the State's history. It is fortunate from an archeological standpoint that Bogy selected this inside space or ceremonial enclosure for the purposes of burial. The presence of the historic dead has protected it from the invading plowshare and preserved it from cultivation, since the coming of the white man down to this period. From an examination of the present condition of these remarkable structures, so close to each other, it would appear that the greater degree of care and skill was used in the smaller. Why two of these should have been built so closely together, differing only in size and width of the embankment or ditch, can not now be determined. The larger of these structures has received less consideration at the hands of historic men. Mr. Ferris, in 1909, concluded that he would plow up the ground, which up to that time had been in grass and covered by forest trees, and produce a crop of Burley tobacco. His neighbors, with some shadow of superstition in their minds, suggested that bad luck might come as a result of disturbing this ancient enclosure. But a desire for a profitable tobacco crop and the extreme fertility of the soil, enriched by one hundred years of bluegrass and other decaying vegetation, quieted what might have been the fears of the owner's husband, and so it was plowed up and planted in tobacco, and from it was obtained a magnificent return. Probably what was one of the largest yields known in Madison County for a long while came from the embankment,

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the ditch, and the plateau inside, all parts of it having been planted.

North of Mrs. Ferris's place, about three miles farther down Silver Creek, is another of these enclosures, almost a counterpart of the two previously described.

Clark County, adjoining Madison on the north, seems also to have been a favorite place for the building of these enclosures. On Amos Turner's farm, about one mile east of Camargo, there is one called in that neighborhood a fort ring, one hundred and fifty feet in diameter. A few hundred yards away is another of about the same size, only it seems to have been laid off as a square and then the corners rounded, without making it a perfect circle, as is the usual shape. Near Morgan's old station on the hill above Slate Creek there is another of these circles, of uniform size and character with those at Camargo, and in close proximity is yet another. Near Hugh Hurt's, on Grassy Lick, there is still another circle, and on the farm of John T. Megowan is an enclosure nearly oval in form, containing about two acres and having three small mounds within this space.

In Clark County, west of Montgomery, on a rise which overlooks the valley of Upper Howard's Creek, is another of these circles, one hundred and eighty feet in diameter. Similar circles are found in Bourbon, Carroll, Mason, and Pendleton counties, and these seem to have run upon a line beginning on the Ohio River at or near Maysville and continuing in a southwesterly direction through Mason, Bourbon, Fayette, Clark, Montgomery, and Madison counties, and they have been found in such large numbers in no other part of the State.

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KENTUCKY'S LARGEST FORT.

It was the writer's good fortune some years ago to bring to public notice certainly the most remarkable prehistoric stone fortification in the State of Kentucky. It is situated in Madison County about three miles east of Berea on the Big Hill Turnpike, and overhangs the head waters of Silver Creek, which, making its way through the rugged lands of the southeastern part of the county, finally empties into the Kentucky River near Idalia, opposite the Jessamine County line.

The writer's attention was called to this structure in 1894 by Honorable French Tipton, who was one of the most patient and laborious antiquarians Kentucky has produced, and whose early death was a great loss to the State; also by Honorable Charles L. Searcey, several times representative in the Lower House of the Kentucky Legislature from Madison County. This fort occupies what is known as Indian Fort Mountain, or Robe's Mountain, which lies close to the corners of Madison, Jackson, Garrard, and Rockcastle counties. (See page 54.) For the military skill displayed in the selection of this mountain as a stronghold, and for the patience and labor expended in building the necessary walls to render it impregnable, too much can not be said in praise of both the genius and the skill of the people who constructed the fortifications. Robe's Mountain is cut off from the surrounding mountains by deep valleys, and at all points but six its sides for a considerable height are so steep and rugged as to be practically unscalable. On the east the top of this mountain is reached by a neck or ridge nearly a mile in length. This approach, which is a gradual ascent, at many points is less than one hundred feet wide,

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and at no place after it leaves the valley for any distance is it more than three hundred feet wide. At the point where this ridge or neck finally reaches the top of the mountain, these ancient people constructed a stone fort by the erection of a wall across the neck of the ridge. This stone wall is three hundred and eighty-seven feet in length. It is built at a point where the slope of the hillside is very steep. Beginning down on the slope, where a foothold could be obtained for the rocks, they were piled one upon the other in irregular shape and form. This stonework, stacked up on the mountain side, at some places measures sixty feet from the lower base of the wall to the top of the embankment, and rises four or five feet above the natural surface within the space to be fortified, making an embankment or parapet of considerable proportions behind which the defenders could stand. Some of the stones which entered into this structure were brought from the valley below, where limestone of a character found in the walls could have been quarried. Some of these weigh as much as five hundred pounds, and they must have been carried on sticks by two or more men up the mountain side, and then deposited in their place in the walls. It is an object of wonder how these people could afford to expend such prodigious labor and such great time in erecting this structure. While many limestone blocks were used in constructing this parapet, sandstone, which abounds in the mountain top, is the prevailing material. The fortification included the whole of the mountain top and contains four or five hundred acres of land. It was naturally defended by precipitous bluffs except at six points. First the neck on which the wall was erected; then about half a mile due east, in a sort of cove, where there is a

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gradual ascent from the valley below, these ancient engineers discovered a pregnable point, and for about seven hundred and twenty-five feet they erected a second stonework built in the same manner as the other, by finding a place on the mountain side sufficiently depressed to admit of a resting place or base for the stone. This second wall extends from the end of one bluff around a curve in the cove to the end of another bluff, and at one end of it there is now in perfect form what the writer has seen nowhere else in Kentucky, with one exception—that is, regularly laid courses of stone. Part of this regular course has been thrown down by the accretion of vegetable mold and earth behind the wall and by the erosion of the earth where the wall rested. About thirty or forty feet of it still remains intact. There is another instance of regularly laid stonework in Nelson County, about five and one half miles from Bardstown on the New Haven Turnpike, which is described more fully elsewhere. Following this bluff which overlooked this stone wall laid in regular courses, and traveling around the side of the mountain for a mile and a quarter, there was no point at which without a scaling ladder it would have been possible for an invading force to reach the top. Here another short stone wall had been erected guarding a narrow defile between two projecting bluffs, up which an enemy in single file might have reached this portion of the top of the mountain. This wall was not more than fifteen or twenty feet in length. Upon one of the cliffs, between which it extended, were some curious as well as pathetic remains. The path or defile along which the invaders must necessarily approach to reach the top of the mountain passed directly under the foot of this overhanging cliff. On this par-

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ticular point there were piled a large number of stones, evidently placed there at the time this fortification was manned, for defense. They were of irregular shapes and sizes, weighing from five to twenty-five pounds, and had evidently been placed by the warriors just as the author saw them, to be thrown down upon the invaders who might seek by this defile to enter the stronghold. There are three other points on the mountain top where stones had been piled as a defense against an invading foe. The area upon top of this mountain, and protected by these artificial stone walls, would measure four or five hundred acres. It would therefore have been necessary, in order to thoroughly make defense, to have had a large number of soldiers within the enclosure. With some knowledge of military matters, the writer thinks nothing short of one thousand men would have adequately manned this fortification so as to make it secure against the approach of an enemy. There are no present evidences that this particular mountain was ever used extensively as a place of residence. A few flints picked up here and there, and an ax or two, are all the remains that would indicate that the men of the Stone Age inhabited this spot. It is probable that this enclosure was never used as a place of habitation, though it might well have been, as there is a large never-failing spring of water within it. It is more likely that in times of danger and invasion a large number of people fled to it as a seat of refuge in which they might find safety from some invading force which did not live in close proximity to the spot. If the foe against which these structures had been erected had inhabited the immediate territory, there would have been evidences of permanent residence within the enclosure; but such evidences are absent.



Gateway in Stone Wall of Fort on Indian Fort Mountain, Madison County,
Kentucky. A wagon road now passes through this entrance



Stone Wall composing part of Stone Fort on Indian Fort Mountain,
near Berea, Madison County, Kentucky



Stone Wall on West Side of Stone Fort on Indian Fort Mountain,
Madison County, Kentucky. The stones at this point were laid in regular courses



North End of Stone Fort on Indian Fort Mountain,
Madison County, Kentucky

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Some ten miles from this spot, in the general direction of Richmond, we found a high point covering the end of a bluff on which there were what appeared at first glance to be stone graves, but upon excavation it seemed that they were more likely stone boxes or ovens in which fires either for cooking or signal purposes were builded. Some six miles farther was found a large mound in direct line with these ovens and the mountain fort, and which from its general appearance the author takes to have been a signal station. It is three hundred and eighty feet in circumference, and has the form of a truncated cone. The top is perfectly level, and has a diameter of forty-two feet. It is known as the Samuels Mound and lies near White's Station, on the Louisville & Nashville Railroad, seven miles from Richmond. It is in an excellent state of preservation, and upon it the unceasing storms and rains of hundreds of years have failed to produce any visible effect. About it have been found a large number of stone axes, arrowheads, pieces of pottery, and other evidences of the presence of men of the Stone Age. On this mound there was nothing to indicate that it had been used as a place of residence. Growing upon the center was a locust tree, which upon being cut down showed an age of one hundred and seventy-five years. The owners of this mound have watched it with such care and pride that they have never allowed it to be disturbed in any way whatever, a course which the writer begged them to continue, as a mound so beautiful and so unique in its characteristics should remain forever as a monument to these vanished people. The proprietors have planted this mound in grapes, and have produced thereon a beautiful vineyard which covers its sides and crowns its crest.

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Running back toward Richmond, about two miles from that city, another mound is seen, with nothing unusual in its appearance. But farther back, east of Richmond on the Waco Road, the writer noted a series of other mounds, and farther on northeast still another series of mounds, these all lying in lines which would indicate there had been through this portion of Kentucky a series of forts and signal mounds, all having some military connection with the structure on Indian Fort Mountain.

At some period this extensive fortification must have been a central rallying point for many villages and for a large population. The labor expended in its building, the care shown in its plan, and its proximity to the mountain ranges south and east of it, would fix its strategic value to the people living north of it for at least fifty miles. A few hundreds of people could not have undertaken the gigantic tasks involved in its erection, and every detail connected with it demonstrates that those who built it considered it a most valuable place of refuge as well as of defense. About it doubtless some great battles were fought and many heroic conflicts waged, and its history embraced some of the most striking events connected with the occupancy of the surrounding country by the Mound Builders during the greatest struggles for their homes and their lives.

One can not resist the temptation to call the dead from their sleep of ages, clothe them with flesh and blood and have them revisit the scenes of their contests for this land, now so beautiful to those who possess it, and which to them, if such thing were possible, would be even dearer and more to be desired.

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IMAGINARY BATTLE SCENE.

Standing on Indian Fort Mountain, lifted five hundred feet above the surrounding plain, facing the beautiful and fertile lands of the bluegrass, which was then the home of these prehistoric people; in sight of their temples of worship, scattered along Silver Creek for five and twenty miles, and drinking in the beauty of a landscape made glorious by Nature's lavish gifts, and seeing on every side their splendid earthen mounds, doubtless sometimes used for sacrifice or signal stations, but more frequently as memorials of their beloved and illustrious dead; surrounded by the implements of war they placed and fashioned a thousand years ago and which have remained unchanged and in many instances unmoved through the centuries which have intervened since living hands and brave hearts used them in defense of their lives and those they loved, it is no difficult task to transport one's self back through the ages and to discover and renew the scenes which once made this very spot radiant with courage and glorious with achievement.

There must have been an hour when a people, harassed and pursued by war's misfortunes, had found on the summit lands of this mountain a place of refuge in times of conflict. The fortifications, built almost entirely of stone, meant great labor and heroic toil. Only the fear of fierce and avenging foes could have caused the construction of this mighty fort of refuge, into which, when war's savage cruelties were imminent, a peaceful and happy tribe could find safety and repose.

One could almost see the invading army, in the dark-

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est hour of the night, stealthily advancing through the thick forest, and catch glimpses of the alert pickets of the fort's defenders as they nimbly and quickly retire before the approach of the moccasined warriors who, in the silence and gloom of the forest, are attempting to steal their way unobserved through the narrow gorges with which Nature has torn the mountain sides above and beyond, and to reinforce which those inside the fort had constructed stone parapets, over which no foe could leap without a death struggle with those who guarded the most sacred possession of life.

On the rock's projections, which overhang narrow passages that lead through the stone walls which Nature had created, and along which two men at most could pass abreast, these prehistoric men had piled rock missiles weighing from five to twenty-five pounds, and on either side had built stone parapets, from which arrows and spears could be hurled upon those below who might attempt to capture the fort.

The whole scene becomes a moving panorama. The invaders, with their feet clad in moccasins, move with the noiselessness of a tiger hunting its prey. Valiant and successful leaders, men great in war and in council, guide the line of march, and in tones almost inaudible speak comforting words to their dusky legions. These captains, with their gorgets and banner stone emblems of authority and leadership, carefully instruct the vanguard, strong and gallant file leaders point the way, and with a keenness of vision and a stealthiness of step that rivals the beasts of the forest in the darkest hour of the night, they press on toward the stone-crowned heights of this mighty fort. They had marched miles with steady tramp

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since the setting of the sun, and they hoped and believed that the enemy within the enclosure knew naught of their presence or their purpose.

Generals within had designed and constructed the marvelous fort. They must have been soldiers of no mean achievement to have located and builded so splendid a place of defense, and they knew the skill and the genius of the foes who had overrun their homes and driven them, their wives and their children, to this spot, on which they were now to make their last brave stand for land and life. Through the long, long hours of the night messenger after messenger had come from the front to tell of the steady tramp of a great pursuing host, bent on destruction, and with its march pointed toward the northern approach to the mountain. They had scouted the woods on every side and they knew that only one line of invasion was designed, and with the true military instinct would assail the fort at its weakest point.

There was no rest nor sleep on the mountain top. Conflict, battle, death, destruction, nerved the arms of those here making their last stand. The fires were smothered, mothers gave the refuge of their bosoms and laps to their offspring, and gathered in groups about the warriors; sleeping children, led and helped by their mothers, lent terror to the scene. From the central camp detachment after detachment was marched to the stone defenses, but the great mass of the defenders, under the inspiration of their greatest leader, was dispatched to the north approach.

We can almost hear the words of encouragement spoken by wives, mothers, sweethearts, and children to the warriors as, girding on their arms, they set out to

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face the foe in a desperate grapple. Fighting was to be at short range. Flint arrows could not reach very far; stone-tipped spears even a less distance, and battle-axes retarded by eight to thirty pounds of weight on six-foot handles meant that foes would, when the real issue came, be very nigh to each other.

The paths along the mountain side were known even in intensest darkness, and the starlight was enough to point where the foe would be found, or where the invaders might press through Nature's rock-rent passages to the plateau above.

Crouched on the huge stone projections, lying on the rock walls with heads just lifted above their line, the beleaguered wait for the coming of the hated foe. In single file, with valiant leaders heading each rank, the pursuers enter the passes. One, two, three, four, five, six pass into the darkness of the chasm, while behind them, with stillest tread, the rear ranks press with vigor and zeal. The three gorges are full; a few steps more and the walls will be scaled. In an instant the curtain falls. A savage, heart-piercing shout rends the air, and down upon the heads of those who had pressed into the narrow passes comes a hail of stone missiles, driven with a fury that tells of hate, bitterness, and despairing courage. The men on the parapets spring up and drive a great storm of arrows into the forms of those who have not yet entered the gorge. War cries fill the air, shouts of battle are met with defiant responses. The crushed forms of the leaders cover the depths of the passes, but over these other invaders rush, to meet a like fate at the hands of the maddened and infuriated stone-throwers who, with unerring accuracy, drive these projectiles down between the walls of the narrow

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passways, carrying death or wounds to those who are forcing their way upward. Up the stone-clad sides of the mountain other lines press, to meet great masses of stone hurled along the rough sides and bounding from point to point, striking down every human form which resists their downward path, while the bowmen send along with these mightier agencies of death a stream of arrows, and the spearmen, planting themselves a little below the parapet heights, hurl long, stone-tipped spears into the masses which are climbing upward to reach the summit of the walls.

Every available reserve of the defenders had been rushed to the point of assailment; as they run, with the speed of the wind, they can hear the shouts of battle, and quickened by war's zeal and fury, they join in the fray. Mothers and children, listening with frenzied fear, had crowded down close to the place of conflict, and they too join in the outcry and the defiant shouts which break the stillness of the night scene far up the sides of the mountain. These warring armies do not speak the same language, but instinct as well as reason interprets the words which both armies shout one to the other, and they need no interpreter on either side to say that each side means death to the other by every means at command.

Nature now begins to lend light upon the places of carnage and death, and, looking along the east over the hills of the bluegrass, they see the coming rays of day, which the Sun God sends to speak to his children and again assure them of his love and protecting care, and as glorious beams of light drive the darkness away, these children of his see before them the havoc and ruin of the night.

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Wounded and dead all but fill the narrow passways, the parapets are strewn with foes who, a few moments before in death grapple, now lie stark and still in the gloom of death. The wounded crawl away from the battle line over the parapet or down the sloping sides of the mountain; yet brave men still rush up the blood-crowned sides, and others, equally as brave, wave defiantly their weapons and bid the invaders come on to the death-dealing onslaught. Honors are yet even. Neither side has been victorious. The invaders, checked, still assault the fort, and the defenders, with a great death list behind them, yet hold the projecting crags. Surer aim comes with the light. The men who had through the hours of the night hurled the stones upon the heads of the invading army now are the targets for the skilled bowmen of the assailing forces, and one by one they fall before the unerring aim of the sharpshooters who, half protected by the trees, send their sharp-pointed missiles as death's messengers into their midst. Wounded, many topple and fall, and yet others, dead, roll over the stone projections upon the bodies of the invaders which have half filled their spaces, and friend and foe, mingled in living and dying mass, grapple with each other in one last struggle for supremacy, and together die in defiant and embittered embrace.

The costly sacrifice is not yet to end. Another effort is to be made, and the brave leaders who have escaped the touch of death direct one more charge. There is no call for rest. The axmen are to lead a forlorn hope. The bowmen send a great cloud of arrows over and against the parapet. The spearmen in solid line lead another charge, and behind these the axmen, burdened with



AX OF GRANITE

Length, ten and one half inches

MAUL OF GRANITE



LARGE GROOVED AXES OF GRANITE

Weighing ten and twelve pounds respectively. From Mound in Louisville
Colonel R. T. Durrett's collection

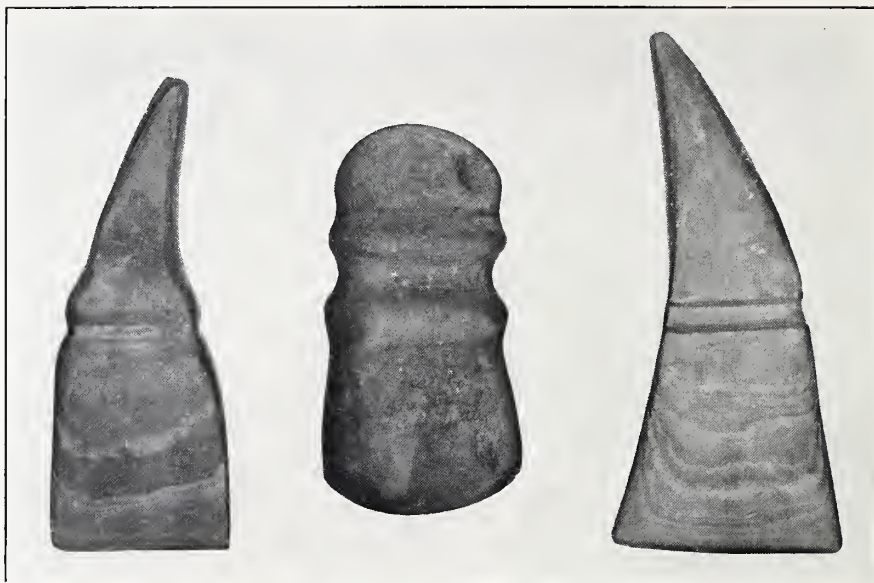


CELTS

Length, eight inches. From Green County



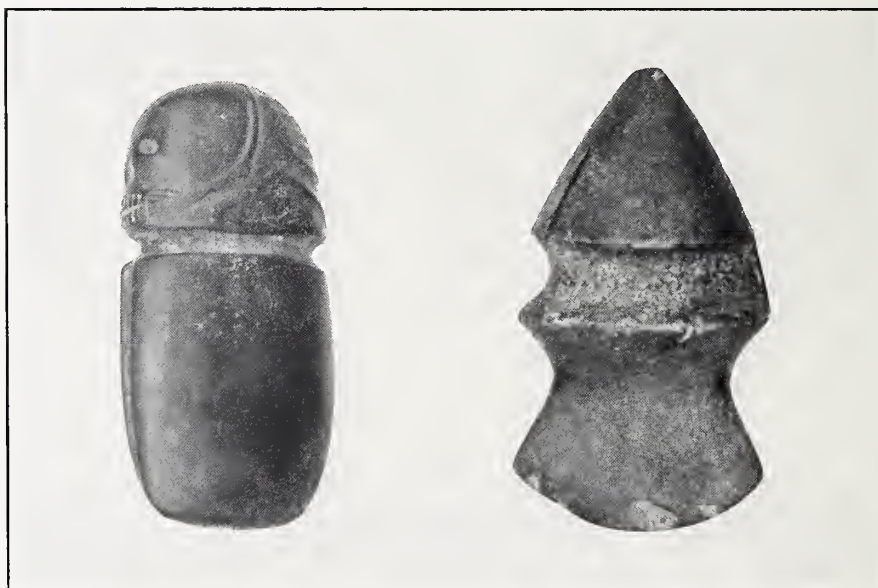
GROOVED AXES



Slate Tomahawk
Trigg County

Grooved Ax
Wayne County

Slate Tomahawk
Trigg County



Ax of Slate, with Skeleton in Relief
Pulaski County

Ax of Quartzite
Eastern Kentucky

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their heavy weapons, clamber up the sides of the rocky wall, here and there crushing the skull of a wounded enemy who had rolled down the declivity and lay prostrate amongst his wounded foes. No voice of mercy touches a single impulse of these savage warriors, and with their cumbrous weapons they calmly and fearlessly make the assault that is to determine the day, and if possible wrest victory from an unwilling fate.

The defenders recognize that the crucial hour has come, and advancing a few feet down the parapet the spearmen prepare to meet the approaching axmen, while the bowmen, with vigorous arm, from the summit speed their arrows with vicious drive into the scrambling column, and the axmen of the beleaguered garrison, crouching behind the parapet or peering over its top, nerve themselves to face the valiant and grim host that, with similar weapons, are pushing up the rocky wall. So far, courage has not been able to stay the advancing tide. When the front line falls a second takes its place. The bowmen still drive their arrows into the bodies of the brawny axmen; the spearmen who are left nimbly avoid the axmen, against whom nothing seems to avail. The summit of the parapet is only a dozen feet away, and the column of axmen, ever supplied from reserve lines, presses up the hillside, apparently invincible. In a moment Greek joins Greek. The axmen inside the fort lift their heads above the parapet; the bowmen and spearmen pass through their lines, and when the space is cleared they leap upon the parapet, swing their great axes about their heads, and rush down upon the ascending line, raise a mighty shout, and mingle with it in wildest uproar. Placed at a disadvantage by fighting upward, the ascending column is stayed, then

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broken, and then flies. No courage, no strength, could defend and prevail against the force and valiance of the descending column, and leaving many a noble warrior with crushed head or body upon the ragged rocks, the invading foe withdraws into the silence and stillness of the forest and leaves its beloved dead in possession of the hated foe.

The battle is over, but those within the fort have paid dreadful tribute to war, and scores of their gallant slain tell of the heroism and gallantry of those who, for wives, children, country, home and fireside, have made such splendid defense of the heights of Indian Fort Mountain on this fatal day.

STONE STRUCTURE IN NELSON COUNTY.

Probably the most remarkable of all the stone remains in Kentucky is found in Nelson County four miles from Bardstown, on the land lately owned by Mr. Jerry Hagan. In 1894 Mr. Hagan was seventy-four years of age, on July 4th. On that day the writer investigated these remains. Mr. Hagan's father came to Kentucky in 1777. On his farm, which had been originally settled by the Richards family, on the banks of Richey's Run six hundred feet west of the Louisville and Nashville turn-pike, there had been constructed two parallel stone walls. These walls were six feet high and in the shape of an L sixteen feet broad, and running east and west and north and south. Beginning at the point which overlooks Richey's Run, these walls were constructed north and south two hundred and twenty-five feet, and then at right angles west two hundred and twenty-five feet. When

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Mr. Hagan's father came to Kentucky the stone remains were in a good state of preservation. Sixty-eight years before 1894 he had sold to a lumber contractor a large poplar tree four feet in diameter, which had grown from out the foundation of the outer wall, which ran north and south. The remains of this tree were present in 1894.

These walls were discovered on investigation to have foundations which carried them down to solid rock, at one point three and a half feet below the surface. The masonry of the foundation was of irregular shaped stones, and after it reached the surface, for some three feet above the ground was constructed of long flat stones about three and a half feet in width and some of them as much as nine feet in length. On the top of these flat slabs, stones of uneven shapes were built to a height of three feet more. The stones used for this purpose were of irregular shape and were fitted together by these ancient stone masons so as to make a strong, compact wall. This fortification or house, whichever it actually was, stood half way between two fine never-failing springs, each five hundred feet distant. At the foot of the hill was one spring, and a little east of south was another spring, and undoubtedly this splendid supply of water had something to do with the location of this work.

When the Louisville and Nashville turnpike was constructed, which was in the forties, it was difficult to obtain rock of the proper sort, and the directors of the company made strenuous efforts to purchase from Mr. Hagan's father the stone with which these walls had been constructed. Other people from time to time endeavored to buy this stone for the purpose of building chimneys and foundations, but the elder Hagan took the ground that

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these were curious and unusual remains—as nobody knew what they were used for—and until some one wise enough should come along to tell the purpose for which they were erected they ought not to be dismantled. The younger Mr. Hagan, being importuned by the directors, consented to sell the stone for three hundred and fifty dollars and a pass for himself and family during life over the turnpike. Hundreds of wagon-loads of stone were hauled away and put into the pike, and the flat stones which constructed the wall for the first two or three feet were used in making caps for foundations, and were also in a large measure supplied to the Louisville and Nashville turnpike for making culverts for many miles north and south of this property. In Mr. Hagan's barn, the houses of his neighbors, and in the chimney are still to be found flat stones taken from this place.

For a considerable space between the two stone walls was laid a stone floor. On this floor in two places were found evidences of fire. It is certain that fires had a number of times been built on this floor. There was no chimney or fireplace. If used for a dwelling, the smoke, as was customary in the houses of these people, could find an outlet only through the roof. Mr. Hagan remembered the size and shape of the walls perfectly, and their length can now be determined by the remains which are still found. The only part which the explorer could investigate was the foundation. The remainder had been taken away.

The walls of the foundation are four feet thick, and the earth had been removed down to the original rock and the masonry constructed on a smooth surface. The stones bear no indications of any metal instruments.

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They were laid with great care and skill, in regular layers. Some of the stones entering into the foundation weigh as much as a thousand pounds. They are a foot thick, and are of the width of the whole wall. Where the large stones are of irregular shape, they were built up so as to make a smooth finished surface, the outside presenting a straight line. These foundations varied in depth from two and one half to three and one half feet. Some of the stones which entered into this foundation could not have been taken from any quarry immediately contiguous to the property, but within the last few years a quarry has been opened a mile and a half distant, which contains stone of the same kind as is found in these walls. Many of these large stones had been brought a considerable distance. The writer saw removed three or four which weighed from eight hundred to one thousand pounds. They had been carried on hand-spikes held by men, or possibly moved on skids when the ground was frozen, which would have made traction easy. Why two parallel walls should have been built in the shape of an L for four hundred and fifty feet, sixteen feet apart, could not be very easily determined, and it was another remarkable fact that quite a portion of the space between the walls had been covered with a stone floor. As said before, these showed numerous traces of fire. On the whole the writer is disposed to think that it was a stone mansion or residence for a large number of people; that across these walls had been placed timbers. The roof had been covered with cane or reeds, probably plastered over with clay, and the spaces between had been used as a dwelling by these early inhabitants of Kentucky.

The location, strategically viewed from a military

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standpoint, could have had no particular value. The ground on which it was built is no higher than many surrounding points, and it could have been approached easily on a level from all sides except from the east, and with the timber growing around it, it could offer no advantages for discovering the advancing foe.

As to the antiquity of these remains there can be no doubt. Mr. Hagan's father settled the place about 1777. When he came it was ancient, and nobody could give any account of it. The poplar tree spoken of grew out of the foundation and lifted a portion of it up more than three feet, and its growth showed certainly more than one hundred years, so that the foundation of this fortification or house, whichever it might be, must have been erected as early as 1677—how many years prior to that time no man may say. It is a source of great regret that it was ever disturbed at all. Had it remained as it was in 1850, we could have found many things in connection with it which would have thrown some light upon the customs and habits of the people who had constructed it, and who had so long before passed into the silence and oblivion of the ages.

PREHISTORIC DRESS.

If it be true that the people who builded the mounds, erected the forts, constructed the graves and temples of worship in Kentucky were the same as the Red Indian, then beginning four hundred years ago we have numerous and accurate accounts of how they dressed. The authorities are so numerous that it is hardly necessary in a statement such as this to quote them.

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Their clothing was prepared in three ways, or generally of three materials; first, of the skins of animals tanned by different methods, sometimes smooth without the hair and again with the hair retained; second, they were made from a combination of cloth and feathers; and third, they were woven into cloth of cat-tail, wild flax, and the bark or lining of the bark of many trees, notably the mulberry, papaw, and linn. Sometimes they used the hair from the buffalo, bear, and other animals so as to weave a cloth with hemp, flag, or bark basis for support. The making of cloth of several kinds in Kentucky is assured beyond all question by specimens which are found at the present time. In the last few months in Salts Cave have been discovered slippers, fragments of blankets or sheets, hats, and pieces of cloth of several figures, which go to confirm the knowledge we have of how the people, at least in one part of Kentucky, dressed in these earliest times. If they used vestments in burial, it is reasonable to suppose that a similar dress was used for ordinary wearing apparel, and the account of the garb of the mummy found in Short Cave about one hundred years ago indicates not only the material but the style of dress which was worn by the people who then lived in that portion of the State.

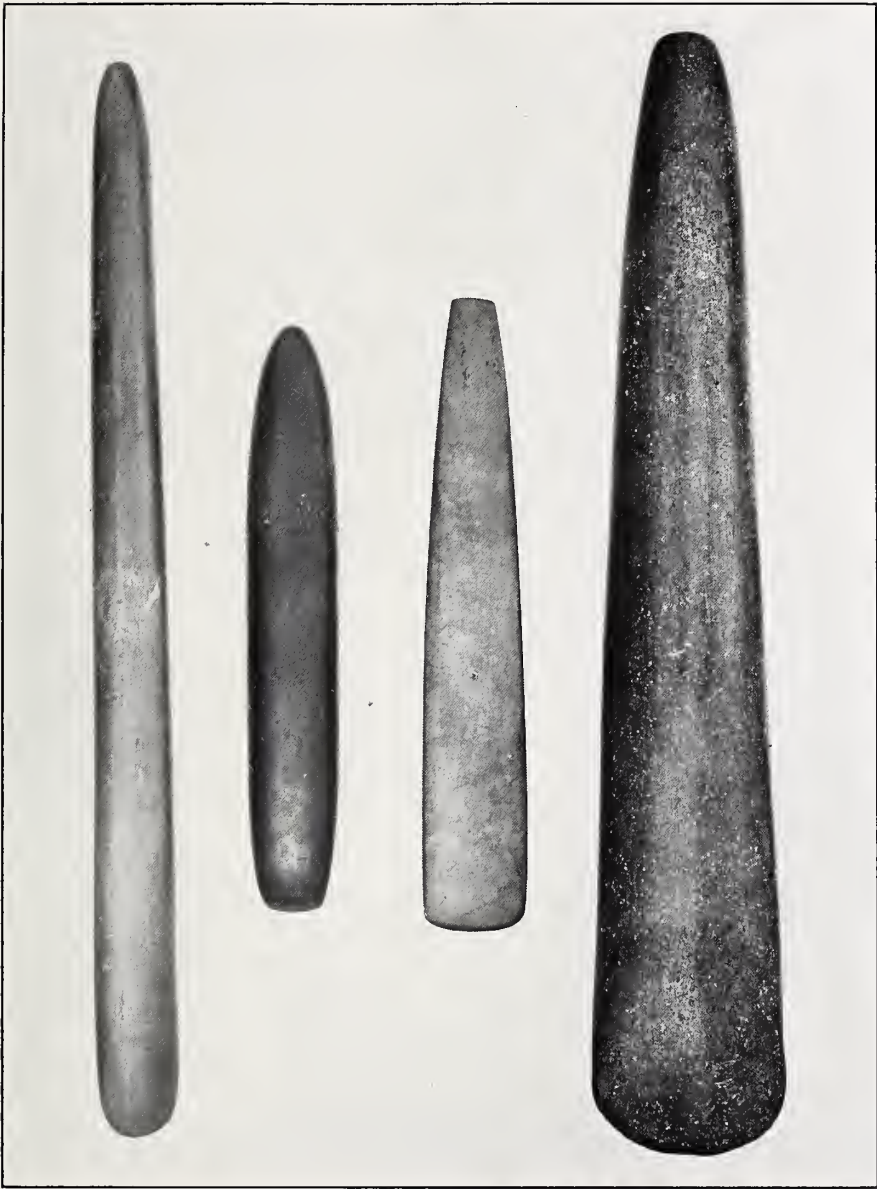
Beginning with the head, the hair was cut short. There has been some difficulty in determining with what instrument this was done, but there are in existence now many flint knives, with which the hair could be easily and readily shortened. Head caps were made of woven or knitted bark, without borders and perfectly plain. The headdresses were made of quills of large birds and put together somewhat in the way feather fans are fashioned,

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except that the pipes of the quills were not drawn to a point, but spread out in straight lines with the top. This was done by perforating the pipe of the quill in two places, running two cords through the holes, and winding them around the quills, thus fastening each quill in the place designed for it. These cords extended some length beyond the quills on each side, so that in placing the feathers erect they could be tied together at the back of the head. This would enable the wearer to present a beautiful display of feathers standing erect and extending some distance above the head, entirely surrounding it. With plumage of variegated colors the effect of this would be beautiful, and the headdress of no woman of this age would be more handsome or striking.

Around the neck the women wore strings of beads. These beads were made either of seeds of trees or bushes, or of shells or stone. Necklaces were made of the red hoofs of fawns. The highest number of these found in any one necklace was twenty. As a locket the claws of eagles through which holes had been made were suspended from the neck, and by way of variety the jaw of a bear was likewise held with a cord placed around the neck.

Deerskins dried, from which the hair was removed, were used as an outer coat. The next coat was composed of a deerskin, the hair of which had been cut away close to the hide. The next garment was a wrapper or short skirt of some kind, made of twine doubled and twisted. This twine was made either from flax or wild hemp or from the lining of barks. Another garment was a mantle of cloth furnished with feathers so as to be capable of guarding the wearer from wet and cold. Father Lallemant, when in Montreal, writing of the Iroquois wars of 1661-62



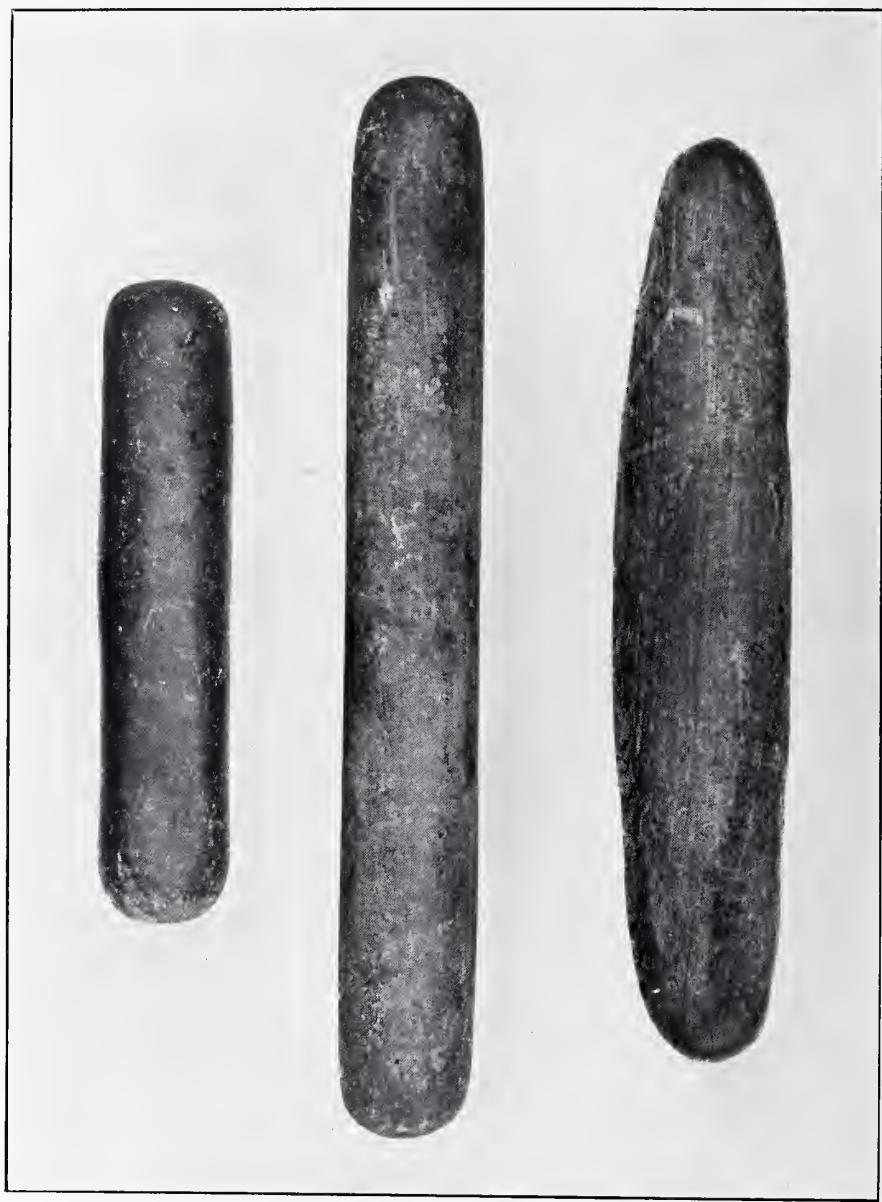
CELTS

Seventeen and one half inches

Eighteen inches

Nine and three fourths inches

Ten and one half inches



PESTLES—ROLLER FORM

Middle specimen seventeen inches in length. From Kenton County

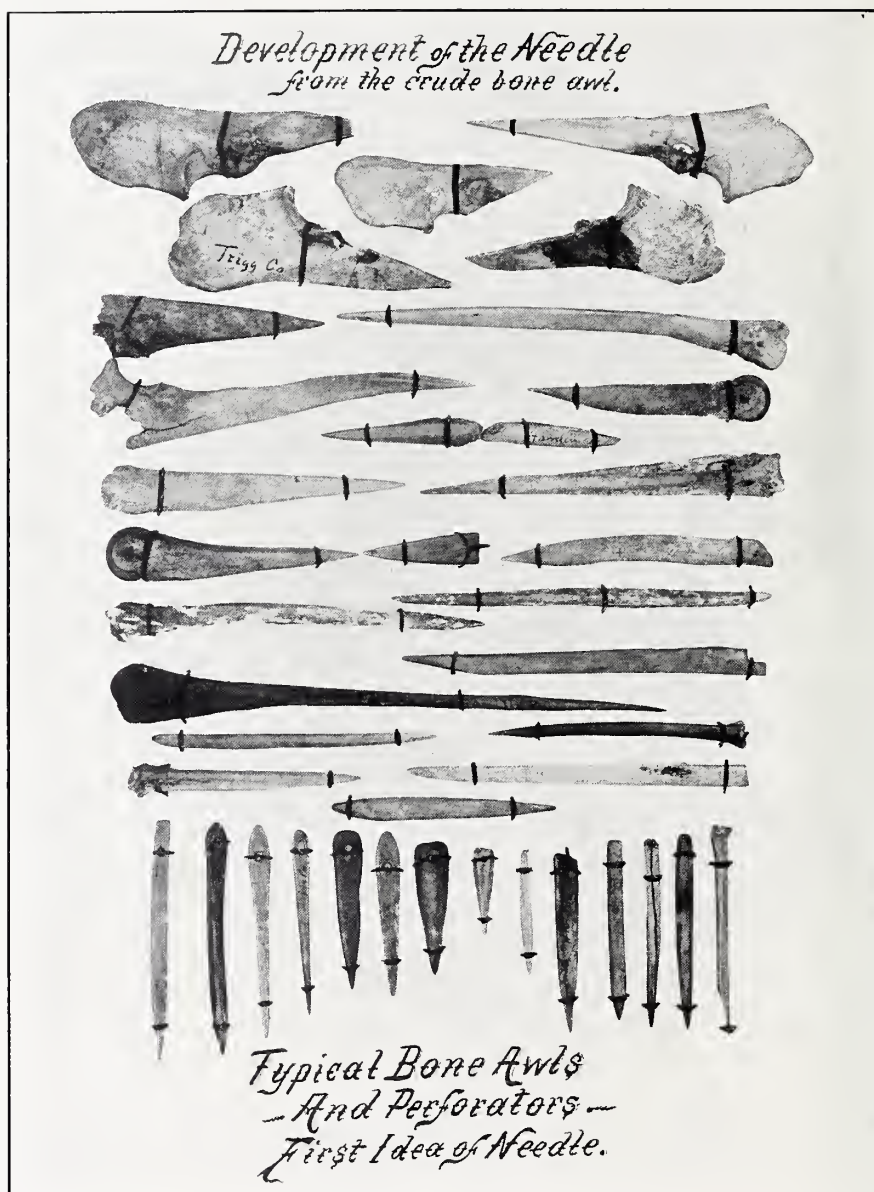


PESTLES—RARE FORMS



STONE BOWLS

Smaller two are of Steatite. Largest of Sandstone



CARD OF BONE AWLS AND NEEDLES
Showing method of mounting. Author's Collection

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and speaking of bands of Iroquois returning from the land of the Shawnees (probably Western Kentucky), says they brought with them "scarfs and belts which had been made from the feathers of small birds by process of interweaving." It is not probable that this order of wearing apparel was always observed, but it shows that these people not only made themselves comfortable, but exhibited much taste and skill in the preparation of their clothing, and considering the circumstances which surrounded them at that period, their clothing was as tasteful, as comfortable, and as cleanly as that of the present pale-faced inhabitants of the Commonwealth.

Several mummies have been found in the caves in Kentucky encased in clothing. There would have been no exclusive preparation of articles of clothing for use in burial. These people would not manufacture garments of various materials simply to clothe the dead, but if they were used in their burials it is sure that they were worn by the living for protection from wet and cold, or from the burning of the summer's sun. In the matter of dress it will be observed that there must have been relatively as much vanity among prehistoric people as among those of the present age who make Kentucky their home.

These people knew the use of dye so as to produce stripes. These stripes were black, brown, yellow, and red. The dyes could be obtained from vegetables and fruits. Walnut dyes were used for years in many parts of Kentucky in the preparation of clothing. As these prehistoric people knew something of both earthen and metallic colors, and as we find several colors appearing now in these garments which have been preserved

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through the centuries, it is sure that they used materials which were striped with various colors, thus giving an artistic effect to the cloth when made into apparel for personal use. It is true that they knew the art of dyeing skins and imprinting upon them the forms of animals and birds and other fantastic shapes. If the skins were thus ornamented which were used in other ways than for clothing, it becomes an assured fact that in their clothing they used the higher and more artistic forms of dyeing and printing. As skins were used for various articles of clothing, there would be no reason why they should be made plain and colorless while blankets, reticules, and knapsacks were made of materials into which color entered for their adornment and ornamentation.

We know these people wore moccasins made from materials obtained either from flax, flags, or barks. The large number of cast-off slippers or moccasins show that these articles of dress must have been universally used.

As reticules and knapsacks were common—this fact being established by the number of these things which are found in several caves in Southwestern Kentucky—it is certain they would not make knapsacks or reticules unless it was necessary to carry something for personal use in these receptacles. They would not have woven and prepared them simply for ornament. There would have been no wisdom or sense in making a reticule if there was nothing to carry in it, or a knapsack if there were no things to be placed in it for transportation. The reticules found contain articles of toilet used by women. They had needles, threads, and thimbles after a fashion, hairpins, small knives which were used in shortening their hair and also in cutting their finger nails and clean-

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ing them. It is not likely that the paints, mineral or metallic, applied to the face, were always done by hand, but it is more probable that they used brushes for the application of these colors to their faces, hands, arms, backs, and bodies generally. It will thus be seen that the prehistoric men and women of Kentucky were well and from a prehistoric standpoint handsomely dressed, and that they had all that was necessary for a comfortable, pleasant, and agreeable life.

Their capes were made either of skins or of plaited or twisted bark, hemp, or flags. These were easily and readily colored with their earthen paints, and as their vessels were thus ornamented with the paint, such as they had, it can not be doubted that their clothing likewise suggested the application of the art necessary to produce colors. These people tanned bearskins, deer-skins, and probably the hides of smaller animals. The fragments of deerskins and bearskins found in the various mounds show that when they were entombing their dead they frequently covered them with skins of various kinds.

NEEDLES, AWLS, AND THREAD.

When prehistoric man came to Kentucky he found a climate that for six months of the year demanded warm dressing. It therefore became essential for him to prepare clothing materials from the wild flax, cat-tail, wiry grass, lining of the bark of trees, or the skins of animals. That he understood the art of tanning is conclusively shown by the tools we find, which must of necessity have been used for this purpose. Celts, scrapers, and knives

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all indicate beyond question that these people were adepts in the art of curing pelts for domestic use. The author was fortunate enough himself to find in one county a fragment of a bearskin which had covered the form of a dead chieftain. It may be asked, How do we know he was a chieftain? Answer, by the things that were placed at his side. No ordinary man would have had copper beads around his neck. No ordinary warrior would have carried a mica-plated pipe, and his position in the mound, in relation to the bodies interred with him, showed that he was the person to whom the memorial had been erected.

If the prehistoric man was to manufacture his garments from skins, it was necessary for him to provide himself with awls or needles by which he could make holes in the skins through which he might pass thread of some kind, and to manufacture a knife which would cut his dressed hides. The awl was doubtless the first of his discoveries. This instrument is found far more frequently than the needle, and in almost every part of the State, either in graves or caches or in caves. They were generally made from the bone of the deer. The needles were sometimes made from the bone of the wild turkey or other bird. Many of these are smooth and worn at the point, indicating long and continuous use. The thread was either strips cut from the skins of animals, else the sinews of the deer, the bear, or wild cat, or twisted grass, flags, or bark lining. The size of the eye of the needles would indicate that they used pieces cut from the hide rather than the tendons. The awl served its purpose for possibly a long time, but human ingenuity, the same relatively in the savage as in the civilized man,

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found it was inconvenient to twist the end of the thread and push it through the hole in the skin made by the awl, and in a little while he invented an awl with a hole in the end opposite the point. He thus evolved the needle. In this hole, as we place the thread in the needle, the strip of skin or thread was inserted, and when the awl was passed through the material it carried the thread with it, and thus much time was saved and great convenience added to the methods of preparing clothing, especially that which was made of skins. That these needles soon came into widespread use is shown by the large numbers found about the sites of villages and in the graves. The prehistoric people did the best they could with the material at hand. Of course a very fine needle could not be made with a piece of bone. Possibly, like the Peruvians, the prehistoric man might have used the honey thorn, which, while not as lasting as the bone, had a finer and smoother point, and would have pierced the garment or skin with much more readiness. The eyes of some of these needles are quite small, indicating one of two things—either that they used different sized materials for thread, or that they learned better to prepare the thread so as to be carried by smaller needles.

The most beautiful specimen of an awl that the author has seen is one found at the foot of the Louisville and Portland Canal, in the city of Louisville. In excavating for the walls of the locks at Thirty-first Street, a large number of axes, awls, and flints of various kinds were unearthed. This particular one is nine and one half inches long, tapering beautifully from within two and one half inches of the head of the bone down to a point almost as fine as a darning needle. The preservation of this bone so many

The Prehistoric Men of Kentucky

hundreds of years in damp, wet soil in the bed of the river is a very unusual circumstance. An illustration of this and other awls will be found on page 106.

The needles in large part were the shape of those now used for sewing burlap sacks. On page 106 are several which are as symmetrical as any metal needle used for coarse sewing, as grain bags or those in which agricultural products are placed. These needles may not be as delicately fashioned as those of the present day, yet the awls, considering that they did not have the art of placing wooden heads on the iron points, are quite as well adapted to the uses to which they were put by these prehistoric people as the awls of 1910. These awls or needles are a curious illustration of man's adaptability to his surroundings. In the climate of the United States, and in a large part of the States composing the temperate zone, these people could not live without adequate clothing. They were not very long in reaching this conclusion. It required no great manifestation of intelligence to teach them that the animals which lived in the woods and roamed the forests were comfortable in winter, and that it was by reason of the skins they wore, and so man undertook to destroy the life of the animal that he might appropriate its skin to his own protection from storms and winter's blasts.

In the matter of thread, it is reasonably certain that the prehistoric man in Kentucky began with the use of strips of skin cut from the hides of the animals which he had killed. When these were tanned they were soft and pliable, but when they were untanned and used as rawhide after drying they became rigid and lacked pliability, which is such an essential element in thread. Later on

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he began to dress skins, and this made his thread-using easier and its hold more continuous. After a while this prehistoric man discovered in taking bark from trees that there was a soft thread-like lining which, twisted or plaited, maintained its pliability and possessed quite a large degree of strength. And so he doubtless twisted the bark lining, and used that as thread when a very great degree of strength was not required. During this period it is likely that he discovered the use of certain grasses in Southern Kentucky which grew to a height of six or seven feet, which were strong and easily twisted, and so from these he managed to get another kind of thread. But later on he discovered that the fibre of the wild hemp or flax, when stripped from the pith, had strength, pliability, and continuity; so he manufactured thread from the lint of the flax or hemp. This thread could be made of much less size, while possessing greater strength, than all the other threads he made except that cut from the skins, either cured or uncured. In a little while he learned to put this on spools, sometimes of wood and sometimes of copper, and this would preserve his thread from being knotted, and when thus wound he could use it in a straight line from the spool or stock around which it was wound. Specimens of this thread, probably five hundred years old, were exhumed from a mound at Lebanon, Kentucky, wound about a copper spool, and thoroughly preserved from decay by contact with the metal, and is, barring natural wear and tear which would arise from exposure to the atmosphere and handling, in as good condition as it was when the prehistoric man wound it around the copper spool which he valued so highly, and which was not only one of his chief ornaments, but also

The Prehistoric Men of Kentucky

one of his most prized treasures. These spools have been found in many parts of Kentucky, notably in Central Kentucky, but the preservation of the thread is unusual and rare. Three of these copper spools, with thread on them, were taken from the same mound, and as stated elsewhere there is a demonstrable age of at least five hundred years to the mound in which they were deposited. The copper spool is the only thing of its kind that has passed the ordeal of the ages. The Mound Builder fashioned cups, dishes, and some other domestic implements from wood with stone knives, aided by fire, but these are so rare that the searcher almost questions whether the prehistoric man had aught to do with them. The metal spool was better fitted to defy the conditions which five hundred or a thousand years would evolve, and through the centuries which have elapsed since these people held Kentucky as their home, it has stood with its thread wound about it to speak of how this ancient people sewed, plaited, and wove.

WEAPONS AND MANNER OF USE.

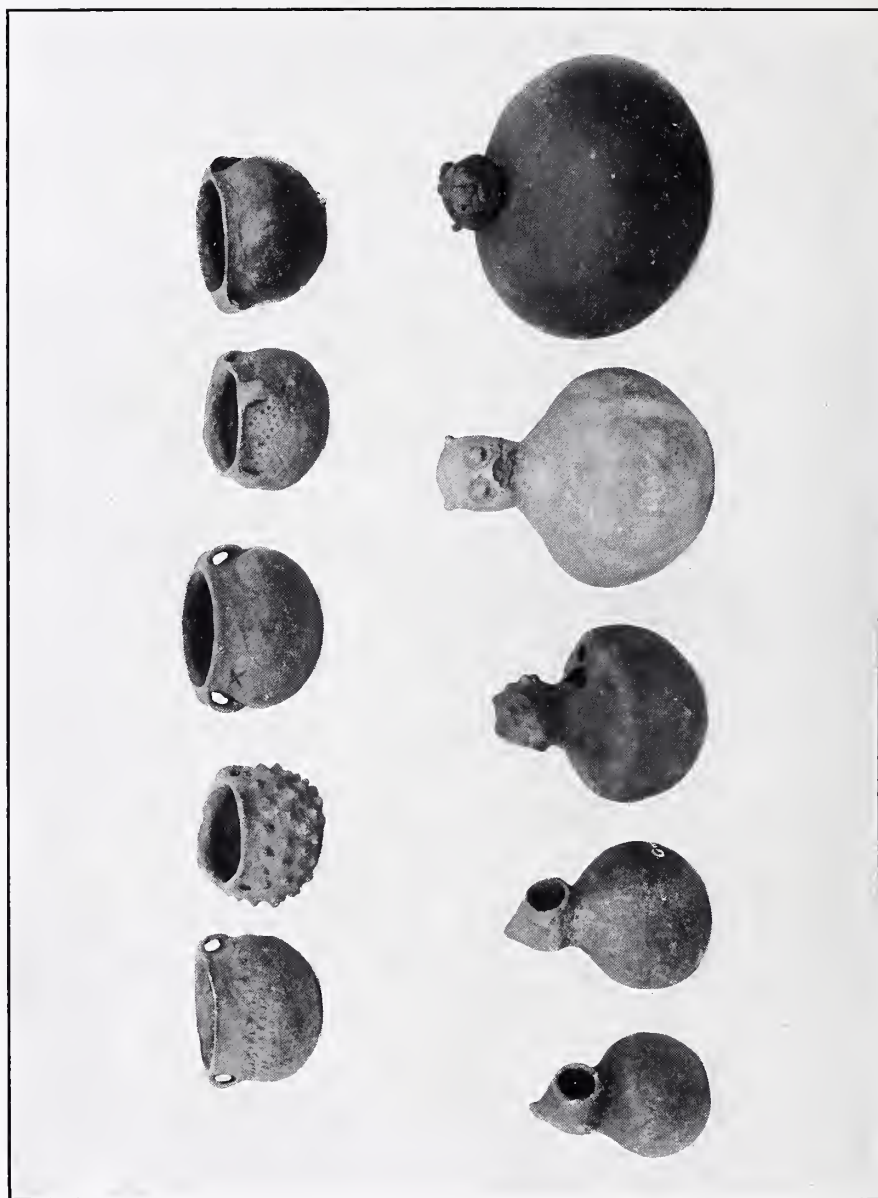
The life of prehistoric man, judging by the large number of fortifications existing in Kentucky to this day, must have been one of constant and general warfare. His weapons were all constructed for conflict at short range.

First was his ax of two kinds, grooved or grooveless. The indications are that these were used contemporaneously, and though this is not certain, their proximity to each other in so many places would tend to



BONE IMPLEMENTS

Johnson Collection



POTS AND WATER JUGS
From Trigg and Adjoining Counties



POTTERY VESSELS
Largely from Northeastern Kentucky



POTTERY VESSELS
From Southern and Central Kentucky



BOWLS FROM VARIOUS PARTS OF KENTUCKY

The Prehistoric Men of Kentucky

show that they were made during the same period. The grooved ax would be more reliable either in domestic use or in war than the grooveless ax, because of the grip of the handle, aided materially by the groove, permitting it to be held much more closely and to admit of heavier strokes and more constant action. The battle-axes vary in weight from one to thirty-two pounds. They were doubtless so variant in weight by reason of the conditions that surrounded the makers, and also by reason of the ability of the user to carry either light or heavy weight. With handles from three to six feet and firmly bound with rawhide, which could be obtained from several animals, these men were enabled to fasten the handle tightly around the ax, either grooved or ungrooved. These axes would require close contact in battle. They had flint saws or knives which enabled them to cut the hickory withe or sapling from which these handles were made. After soaking the handle in hot water, or for that matter in cold water, it could easily have been bent around the ax and tied with rawhide, which, by its contraction when drying, would press the handle closely in the groove.

They also used what is known as a battle-ax blade, that is, a thin piece of flint, oval in shape, about five by three and a half inches. By splitting the handle and placing the flint blade between it, and then binding with rawhide, they were enabled to fasten it very securely. These handles were about two or two and a half feet in length, and with the blade projecting on either side, became a dangerous weapon at close range.

The most damage, however, done by these prehistoric people was doubtless accomplished by the bow and arrow. The bows were about six feet in length, judging by the

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strings which we have seen and one of which the writer has been able to secure from Salts Cave. They would be made of many woods, preferably of hickory, cedar, or ash, but hickory usually possesses greater strength than other timbers of similar size. It is not probable that they had any tools with which they could split the hickory trees. They would therefore be compelled to use the hickory saplings in the manufacture of bow staves.

The penetrative force of the stone-tipped arrow, driven by the strong and skillful arms of these prehistoric men, must have been very great. Quite a number of instances are known and specimens preserved in which they were driven practically through the larger bones of the body. The author has a human pelvis found in a cave in Meade County. Imbedded in this is a portion of a flint arrow-point, the position of which shows that it had been driven through the body, penetrating the bone on the opposite side from which it entered. The point reached into the socket of the hip joint. There it remained, causing necrosis of the bone, until by processes of Nature the wastage was stopped, and the point remained in the bone until the death of the individual, which the indications show occurred long after receiving the wound. In one instance an arrowhead was driven three inches into the bone of the leg just below its union with the hip, and evidently caused the death of the party into whom it had been shot. A number of instances are known in which these arrowheads penetrated several inches into bone, and it was no unusual thing that they attained sufficient penetrative force to drive them through both coverings of the skull.

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Three of these arrowheads that have come under the immediate observation of the author are not sharp at all, but rather blunt. The smaller triangular arrowheads, if sufficiently strong—and probably they were—could have been driven readily into bone without the use of any great force, but an arrow-point about three inches in length, and with a blunt point, thus driven into the bones of the body, demonstrates beyond all question that the power which was used in their propulsion must have been comparatively very great.

The wooden or cane shafts probably were tipped with many kinds of points, some beveled, some serrated, some triangular, some blunt, being fastened thereto with the sinew of the deer or other animal. There are some evidences, although not entirely conclusive, that these arrow-points were often tipped with poison. It is said that at one time the Shawnees in Western Kentucky were so well versed in the use of poisons that they could place them in springs and thus destroy their enemies, and also that quite large streams of water were impregnated with these dangerous elements. We sometimes comment upon the savageness of the methods of these people, but the poisoned arrow is no worse than the soft-nose or explosive bullet, which has been used by civilized nations in the memory of living people.

The next weapon was the spear. These carried points so large that they could not have been used with the ordinary bow. They must have been attached to a larger piece of wood or cane than the arrow-shaft. They were probably mounted upon cane or pieces of wood from four and one half to seven feet in length. They were doubtless used also in the destruction of the larger animals,

The Prehistoric Men of Kentucky

either bears or buffaloes, during the buffalo period in Kentucky. The spear would be much more formidable in close quarters with an animal even as large as the wild-cat than the bow and arrow. It would be comparatively as efficient as the bayonet of modern times.

Many of the flint knives were mounted on wooden handles. These sometimes measure from one to ten inches in length, and at very close range would become formidable weapons—not as formidable, however, as the battle-ax blade which has been described above.

In Kentucky there are no evidences of the cross-bow having been used. The five weapons which we have described completed the military accoutrement of these men, who must have spent a large portion of their lives in warlike scenes and exploits.

AXES, CELTS, PESTLES, AND MORTARS.

The stone ax was one of the most useful implements of prehistoric man. With it, aided by fire, he felled the forest trees, and in his warfare it was his most trusted and reliable weapon. The distribution of implements of this class is very general throughout the State, and there is little variance of form manifested in the different sections. Grooved axes are found alike in the mounds, stone graves, and upon the surface of plowed fields. Other than the changes worked by atmospheric agencies, those from the stone graves or plowed fields do not differ from those of the mounds. It is an interesting fact, however, that comparatively few grooved axes are found in connection with burials, either in mounds or stone graves,

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while grooveless axes or celts occur frequently in both. The grooved forms vary in size from small specimens weighing scarcely an ounce to massive implements of twenty and even thirty pounds. The great majority, however, weigh between three and five pounds. The material used in their manufacture consists of almost every hard, tough rock found in Kentucky, and many not native to the State. In the author's collection of nearly three thousand axes and celts, there are specimens of marble, argillite, greenstone, diorite, syenite, granite, limestone, sandstone, quartzite, occasionally hematite, and even clay. A beautiful specimen of hematite comes from Trigg County, and some fourteen or fifteen years ago two of clay were found in Todd County near the Tennessee line.

In many of the grooved implements a ridge has been left encircling the weapon, in which the groove is cut. Frequently the groove is formed in the body of the ax after the latter has been dressed into shape. In many the grooves extend entirely around the implement, in others about only three sides, leaving the back flat. In some cases the back is provided with a longitudinal groove, probably intended for the insertion of a wedge in order to tighten the ax in its hafting when it might work loose. That the prehistoric Kentuckian was an economist of labor is certain. Many specimens show that the edges had been broken or dulled and afterward resharpened. Often this process has been carried on until the blade is but a small fraction of its original length.

The numbers of these axes, both grooved and ungrooved, surpass calculation, and now and then, where some conflict likely occurred, they are found in vast numbers.

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Kentucky in pre-Columbian times must have been very heavily timbered. The fighting was always at close range. The spear would do well enough for some battles; the arrow, where there was some space, would accomplish its purpose; but in the close, fierce conflicts that must have been precipitated in the battles of those days, the ax was the chief worker. The use of these weapons required a very high order of courage. Those who are accustomed to war know that close range is the test of fighting qualities, and when in battle array, man to man, face to face, these contending legions met, there was sure to be an exhibition of very great bravery.

Grooved axes were mounted in two ways; first by splitting a withe, inserting the ax, and then binding it with rawhide on either side of the implement, or by binding the withe around the ax and tying it with rawhide, which, when contracted, would render the mounting firm. It would be impossible to use these axes at all without a flexible handle. An ax weighing four or five pounds, rigidly fixed, where the handle would not yield as a result of the blow and thus relieve it of the force of the concussion, would be quickly shattered. Felling trees with stone implements was necessarily a tedious process, but with an ax weighing seven or eight pounds, mounted upon a suitable handle, the fibre of the wood could be bruised and then removed with a flint knife, or else partially burned, the charred portions being removed by means of the stone ax, and even a large tree, by either of these methods, could be cut down with a reasonable amount of labor.

It is more than probable that, in the evolution of the stone ax, the grooved ax succeeded the grooveless ax or

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celt. Its adaptation to a handle made of wood, and the ease with which a connection between the ax and the handle could be made, would render it a great improvement on the celt or grooveless implement.

It is interesting to note the many kinds of axes that are found. Some of the very crudest possible forms are stone taken from any source, about the size of the desired implement, and broken, pecked, or rubbed into some sort of shape resembling an ax. The skilled stone worker would produce an instrument shapely and well finished, while the man who did not have the means at his command to secure a highly polished and finished ax, would himself, without any very great labor and in a careless and unskilled way, put the stone into some sort of shape as would have the appearance and serve the purpose of an ax. The well-finished granite ax of course would demand a large expenditure of time and work. They are comparatively rare, and were likely used by those who had sufficient of the good things of life at that period to justify them in having some of its luxuries.

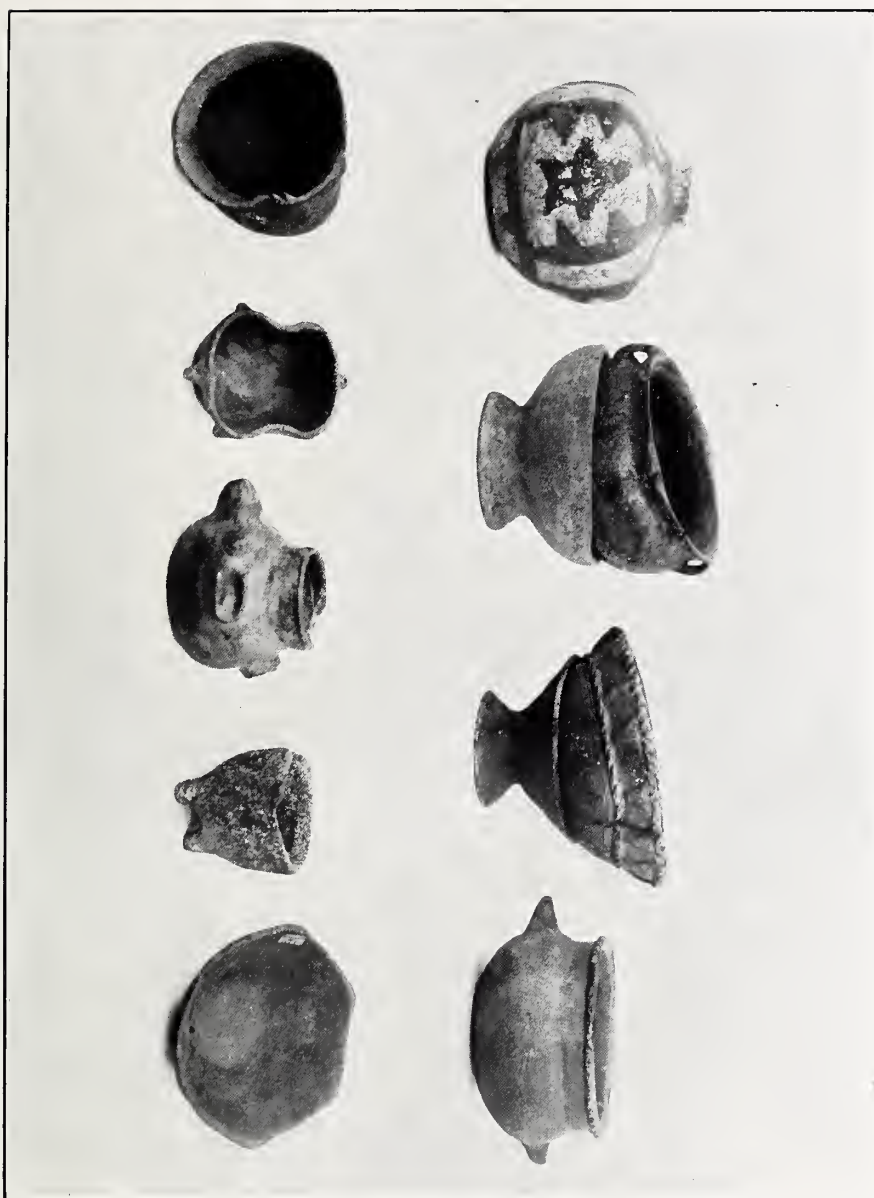
The remains show that there were children's axes, and great care was exercised by these people to provide implements which small-sized boys could use with readiness and ease. The largest specimen of the grooved ax which has been found in Kentucky, so far as the writer knows, is shown on page 93. It weighs thirty-two pounds, and was found in Christian County. This magnificent specimen is fifteen inches long by eight and one half inches wide. The groove encircles it. The head is rounded, and there is also a longitudinal groove along the back for the insertion of a wedge, in order to tighten it in the handle. The second largest ax found in Kentucky is

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made of a hard stone unknown to the writer. It is thirteen and one half inches in length by eight inches wide, and weighs thirty pounds. The third ax weighs eighteen and a half pounds, is eleven inches long and seven inches wide. It is made from a boulder of hard, dark colored material. From these large implements they run down through all lengths and shapes and sizes, until the baby axes are reached. Whether these smallest axes were used as beads or ornaments or charms there is no way now to determine, but they have the perfect ax form, and, if used as axes at all, they must have been used by the children in their play.

On page 94 is an unusual product of the ancient ax-maker. It was found near Somerset, in Pulaski County, about the waters of the Cumberland River. It is grooved, and there is a skeleton face carved upon its head. The mouth, nose, and eyes are perfectly distinct, and upon the side of the implement opposite this skull-like face may be seen a complete skeleton worked in relief. This implement is highly polished, and is one of the most interesting and unusual specimens known. Another very unusual ax is shown upon the same plate. It was either made for a ceremonial instrument or was a combined tomahawk and ax. The head of the ax is brought to a sharp point, while the blade widens into a fan-like appearance. The material appears to be quartzite.

Celts or grooveless axes are much more numerous than are the grooved varieties. Many of these were probably not designed to be mounted on handles but were held in the hand when used, either as chopping implements or in the dressing of skins. Yet from specimens discovered in other parts of the country it is evident



CUPS, BOTTLES, DISHES, AND POTS
From Southwestern Kentucky



POTTERY VASES

About one ninth actual size. Southern and Central Kentucky



CUPS, SPOONS, AND WATER BOTTLES
One third actual size



CUPS, DISHES, AND WATER BOTTLES

From Southwestern Kentucky. Lower row, W. P. Taylor Collection

The Prehistoric Men of Kentucky

that they were frequently mounted on wooden handles. The handle at the point where the celt was to be mounted was enlarged, and a hole made in it of sufficient size to retain the head of the implement. Thus held, it would make a most serviceable weapon or tool.

PESTLES.

Pestles are found in all portions of Kentucky, and played a most important part in the domestic service. It would be an interesting study to work out the problems involved in the food preparation. It is easy to see how they pounded the corn, eliminating the husks and the heart and reducing it to coarse meal, in which form it would be more palatable, easier to chew, and more readily digested. The discovery of the appliance of heat to this end must have been accidental. To determine this presupposed, in the first place, a knowledge of fire, and second, the use of vessels which would hold water and which could be subjected to heat to warm the water, and thus soften the particles of mashed corn or other materials, and render them more readily assimilated by the human body.

In Kentucky the Mound Builders only needed to crush or grind three things—corn, meat, and nuts. The earliest method of doing this was probably by the use of two flat stones, between which the materials could be prepared. After a time this method became cumbersome, and rounded pestles were made. With the introduction of the rounded pestle of course would come the mortar, in order that the material which was to be crushed could be placed more directly under the blow of the implement,

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and be in position where the stroke would be most effective. In a little while it is probable that pestles were made with expanded base, with bottom flat or slightly convex, and sometimes with a small depression in the middle. The handle was made tapering, and of sufficient size to permit a firm grasp between the thumb and fingers. It may be said of pestles, as axes, that they were fashioned of every available material, and with varying shapes. Some were conical, occasionally grooved; some rounded at the top and flat at the bottom, and others bearing a very striking resemblance to what is called a rolling-pin; the longest of which the writer has observed in Kentucky measures seventeen inches in length by three inches in diameter. (See page 104.) These pestles of cylindrical form are rare in this State. The other forms would be used probably fifty times where the long cylinder was used once. These cylindrical types now and then are discovered of very small size, not more than three or four inches in length and half an inch to an inch in diameter. It has been suggested, with some show of reason, that these were probably used by the tribal doctor in compounding herbs which constituted the drug supply. Here and there are found pestles made of rare stone and polished with great care and skill.

The usage to which this class of implements was applied is not a matter of dispute among those who are interested in archeology. Every one concedes that they were pestles and were very commonly used. The wearing away of the lower end, which is so often observed, could have been done by no other process than by grinding or pounding. Many show great economy in prehistoric domestic life. They have been worn to such small proportions that the object is but a fraction of its former size.

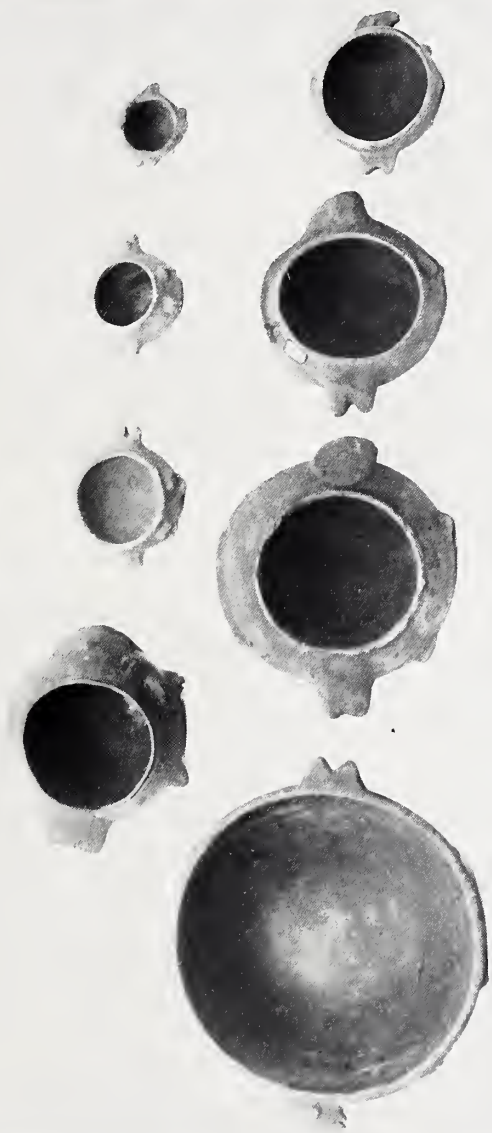
The Prehistoric Men of Kentucky

MORTARS.

When the pestle came into general use the mortar of necessity followed. If there was something to grind there must be something upon which the grinding could be done. This was undoubtedly in the early stages of prehistoric domestic life merely a flat stone. As soon as the prehistoric man realized the advantage of a pestle with broadened base, yet so formed as to enable the holder to grasp it firmly, he realized the necessity of an improved surface upon which the matter to be ground could be placed. He soon learned that a rounded cavity would permit a greater surface for the grinding, and by the concave form the material being ground would move to the center of the depression. This doubtless grew until the well-defined bowl mortar was evolved. Many of the larger and finer specimens made of sandstone and soapstone, which have been found in the central and southeastern part of the State, were probably used as cooking utensils as well as for grinding purposes. Steatite and sandstone make excellent ovens. These are in a large measure indestructible by any heat that would be applied in cooking, and at the same time the materials were easily worked, and it is certain that throughout Kentucky these sandstone and soapstone vessels were both used in cooking. The making of these utensils, even of the softer rocks, with the limited means at hand, was doubtless a slow and tedious process and one that required a very high order of patience to secure a sufficient depression to render the oven useful and effective. But as time was of comparatively little value to these people, the

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labor of days and even weeks consumed in the preparation of these objects, which in the end would add so much to the comfort and welfare of the domestic life, was not begrudged. Sandstone was obtainable in many parts of Kentucky. Steatite was necessary to be brought from other States, but this did not deter the Mound Builders from using it in large quantities. The largest mortar that the writer has seen in this section weighs thirty-five pounds and is in the shape of the old-fashioned wooden bread-tray. It measures eighteen inches in length. One in the writer's collection, from Franklin County, shows that it was designed to be fitted between the knees when in use. Judging from the depth of the cavity of this peculiar specimen, it is probable that it was kept for cracking walnuts or hickory nuts. No other specimen has been observed which has this same hollowing out on the sides in order to fit the shape of the knees, thus permitting it to be held firmly and securely while the pounding took place upon the upper surface. A remarkable stone mortar or bowl was found about fifteen years ago in Washington County. It is made of crystalline limestone, comparatively smoothly finished on the outside, while the inner or bowl surface has been carefully polished. This specimen in size and shape resembles the ordinary wash-basin. About the rim are four projecting knobs by which it could be held. Altogether this is one of the finest and rarest stone vessels that has been discovered. On page 105 is shown three of these mortars from the author's collection. The largest is made of sandstone, the others of steatite.



POTTERY BOWLS

Imitation of Fish. From Southern Kentucky



VASES—One fifth actual size

Hickman County

Trigg County

Trigg County



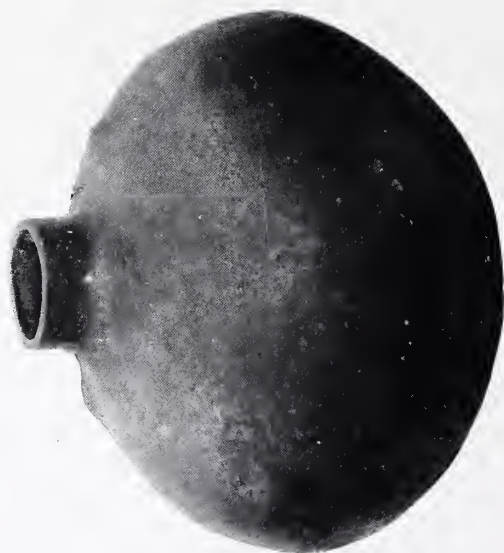
LARGE COOKING POT

Height, eight and one half inches; circumference, thirty inches
Barren County

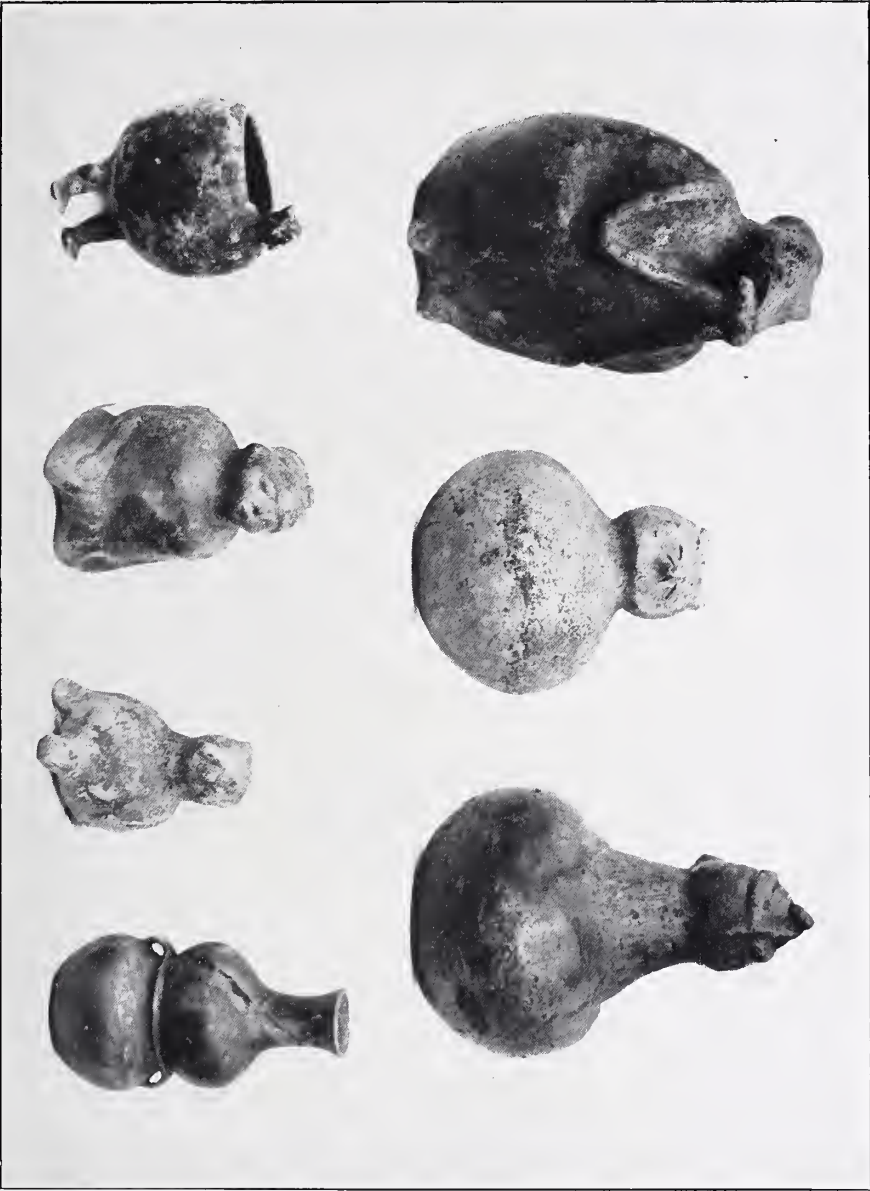


LARGE POTTERY VESSELS

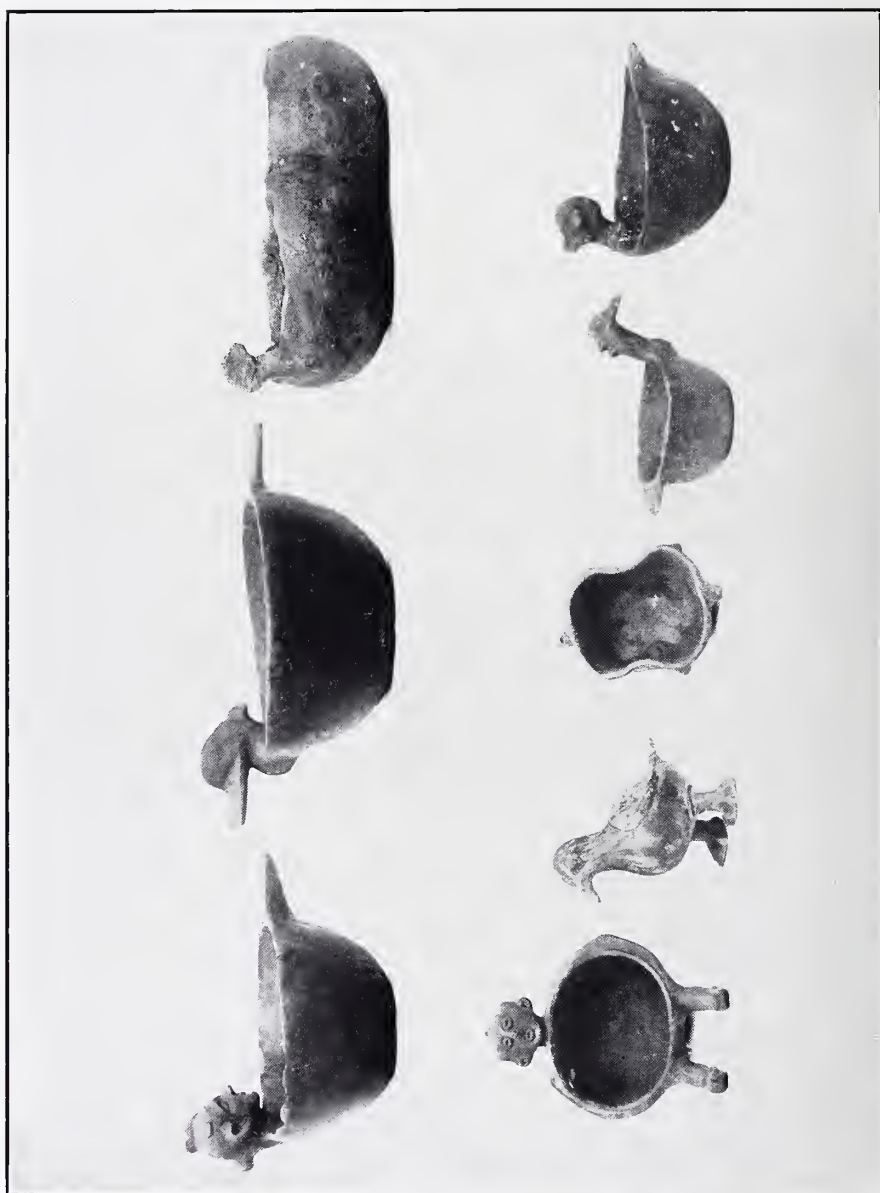
Height, twelve inches; circumference,
forty inches
Warren County



Height, twelve inches; circumference, forty
and one half inches
Pulaski County



CUP AND WATER BOTTLES
Fulton County. Taylor Collection



CUPS, DISHES, AND BIRD RATTLE
From Southern Kentucky and Middle Tennessee



EFFIGY POTTERY

From Trigg County. Johnson Collection

POT



TURKEY BOWL

One half size. The feathers are painted in black upon the body
Fulton County. W. P. Taylor Collection



WATER BOTTLES AND CUPS

Southern Kentucky

The Prehistoric Men of Kentucky

POTTERY WARE AND IMPLEMENTS.

Pottery vessels, pipes, axes, shell and flint implements, large or small, constitute the vast majority of the remains of the prehistoric people. In Eastern and Central Kentucky pottery was never very abundant. Here and there perfect specimens may be found, and in many places large numbers of fragments are to be seen, but the great center of pottery-making, in so far as the remains indicate, is found west of Salt River. That the prehistoric people began the manufacture of pottery hundreds of years before the white man appeared, has been demonstrated in sundry ways so as to no longer admit of doubt, and that this manufacture reached a very high state before the red man ever heard of the white man is equally true. Kentucky, Tennessee, Missouri, and Arkansas excel in pottery. In Kentucky, along the Cumberland River, have been found some of the very best specimens of this ware that were manufactured; not the most ornate, for to Arkansas, Southern Missouri, and Tennessee are to be attributed the best ornamented forms. But the pottery found along the Tennessee and Cumberland rivers, much of which will ring when struck, shows that these people understood the art of hardening or tempering their ware so as to render it impervious to the effects of moisture.

The mound-building people of the Mississippi Valley displayed a wide range of originality and skill in the plastic arts. Their pottery ware covered an extensive variety of uses. From it were made images, pipes, toys, rattles, drinking cups, spools, ornaments, beads, trowels, and domestic vessels for storing and cooking. The use of

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pottery was distributed over a large portion of the American Continent. Not only was it generally made, but the remains found show that it was generally used, and this variety of use developed in many places great artistic skill. Ornamented pottery is not very abundant in Kentucky, and practically all that has been found comes from the western and southern portions of the State. The ornamentation on these vessels was done in several ways, sometimes by pressing coarse cloth upon the soft clay, sometimes by marking it with a sharp or blunt instrument, or even the finger nails; again by pressing it against forms of willow or other wood, which indented it. Usually these ornamental designs were made while the clay paste was in a soft and plastic condition, but sometimes even after it had been hardened. Considering the lack of resisting power of the material, these people showed great skill in forming the larger vessels. The largest of these were evidently salt kettles or pans. The action of the fire with which these vessels were hardened was most likely indirect, as pounded mussel shells, with a loam more or less impregnated with clay, were the materials from which they were prepared. It is certain that they could not have been subjected to a very high degree of direct heat without the particles of shell becoming calcined, thus rendering the vessel likely to leak and making it less resistant. In a number of these vessels the existing conditions show that they were subjected to the direct action of fire after their manufacture. In all cases where this was done it was followed by the crumbling of the particles of shell imbedded in the clay at the point of contact with the fire, while the unburned portion contained the particles of shell in their original hardness.

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The most complete account of aboriginal American pottery ever prepared is that of Professor W. H. Holmes, contained in the Report of the Bureau of Ethnology for 1903. For accuracy of statement, breadth of observation, carefulness of research, completeness of detail, and thoroughness of delineation, this work has never been excelled. It is almost impossible to suppose that one person could have made such a large number of investigations as fell to the lot of Professor Holmes, and to have examined with such a high degree of intelligence the thousands of ceramic forms that are exhibited in this wonderful work. On this subject it is a library in itself.

In the caves of Kentucky some pottery has been found, but the great finds came from the stone graves. The regions along the Mississippi, Tennessee, Tradewater, Barren, Green, and Little rivers have been most prolific. Here and there, about the headwaters of the Cumberland and Kentucky rivers, specimens of pottery are found, and while excellent in form and finish their occurrence is comparatively rare, and the bulk, whether for domestic use or ornamentation, comes from the southern and western portions of the State.

Among the thousands of specimens of vessels discovered, no two are exactly alike. This demonstrates that this work was all done by hand, without the use of molds or forms, or even the potter's wheel. They had what is known among archeologists as trowels, made of clay, somewhat of the shape of an inverted mushroom. These are smooth on the outer and rounded surface, and were undoubtedly manufactured for the purpose of shaping as well as smoothing the vessels. In Christian County was found a trowel of a slightly different pattern. The

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smooth surface is flat and oval in form, with a handle attached somewhat after the manner of a flatiron. It is similar to the trowels described by General Thruston in "Antiquities of Tennessee."

One of the most interesting features in connection with the manufacture of pottery is the large number of vessels and implements which are so diminutive as to leave but little doubt that they were prepared for the use of the children. In any large collection in Tennessee or Southern and Western Kentucky, which has been at all carefully selected, are many specimens which by their size, form, and finish indicate that they were playthings for young people. The smallest of these vessels are very little larger than a good-sized thimble. Many of them do not hold more than one or two ounces. They are seen in the form of drinking vessels, cups, and jugs, sometimes with a hole through the upper end, in which can be seen the effects of friction caused from its hanging by a string, showing that even the children carried their drinking vessels, either at play or upon journeys. None of them were ornamented by impressed designs, though they are sometimes made in the shape of animals, especially the frog and fish. While these little vessels indicate apparent thoughtfulness and affection, they show that the higher forms of skill in the manufacture of pottery was not exercised in the preparation of these toys, and suggest that perhaps many of them were made by the children themselves.

The vast number of specimens of pottery, large and small, ornamented and not ornamented, which have remained over in perfect form through the lapse of hundreds of years, show two things,—first, that the manufacture of

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pottery ware was universal among the prehistoric people; and second, that in order to produce this large number of remains there must have been a vast population inhabiting the regions bordering on the Ohio River, south and north, and along the Cumberland, Tennessee, Green, and Barren. It must be remembered further, in connection with this statement, that much of the prehistoric pottery was merely sun-dried and has disintegrated in the soil, only the most fragmentary parts now remaining. The fragments found in the mounds and in and about almost every village site shows that the number of vessels of pottery prepared was almost unlimited.

CHIPPED STONE IMPLEMENTS.

No class of aboriginal artifacts are found in such vast quantities or distributed over so wide an area as the chipped implements of flint or kindred chalcedonic rock, and few are of more interest to the archeologist. In every section of Kentucky these implements occur in greater or less number, varying in size from large agricultural specimens measuring eighteen inches to minute arrow-points of such proportions as to preclude use for any practical purpose. The forms designated arrow-points and spearheads are picked up literally by the thousands. Along all the fertile river bottoms the numerous flakes and cores of flint show where the prehistoric man of Kentucky had habitation or temporarily encamped on his hunting expeditions and where he manufactured these useful implements. In many places, notably in Mercer, Wayne, Nicholas, and Boyle counties, arrow-points and spearheads accompanied by axes have been turned up by the plow

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in almost countless numbers away from ancient village sites, mute witnesses of a time when hostile tribes in deadly feud contended for the mastery of Kentucky.

In the author's collection are upward of forty thousand of these implements, illustrating every form, displaying every degree of skill, and every phase of workmanship of the prehistoric lapidary. Many are beautifully chipped in graceful forms, others fashioned in a crude and clumsy manner. Obviously every aborigine was not a skilled worker in stone. There were men in every tribe who, by natural aptitude and long practice, became adepts in this difficult art; they devoted their whole time to the work, and tradition has it that as from time to time they accumulated a store of these implements they would journey into distant regions to barter their wares for the products of other sections. The arrow-maker of Kentucky penetrated the mountains of North Carolina and exchanged his flints for mica and steatite; to Pennsylvania he went for graphite, and to Missouri for hematite. In Minnesota he sought the wonderful pipe-stone quarries, and in Michigan secured the highly prized copper of Lake Superior. From the Gulf of Mexico and the shores of the South Atlantic he brought to his lodge in Kentucky beautiful seashells fashioned into beads and pendants of exquisite lustre, and cunningly wrought gorgets of curious form. It is said that while engaged in these commercial pursuits free passage was accorded him. His vocation was respected and rendered him immune to dangers which usually would beset a traveler through hostile territory. That such a trade was carried on not only in flint but other products, is amply demonstrated by the vast number of relics, the material of which is

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nowhere found *in situ* in the State. In Mercer, Trigg, Warren, and Christian counties have been found arrow-points of obsidian, the source of which lies not nearer than New Mexico or the Rocky Mountains.

War parties frequently brought these foreign products to the places where we now find them. It is well known that the historic Indians frequently went on hostile excursions into territory many hundred miles distant. In "Jesuit Relations" (Volume 47, page 145), Father Lallemant, writing of the Iroquois Wars of 1661-62, says: "Proceeding rather westerly than southerly another band of Iroquois is going four hundred leagues from here in pursuit of a nation whose only offense consists in its not being Iroquois. It is called Ontoagannha, signifying 'the place where people can not speak,' because of the corrupt Algonquin in use there. . . . Be that as it may, against those people the Onnontaheronnon Iroquois have turned their arms, to appease (as they say) the souls of those of their number who were killed there eight or nine years ago. Those souls will find no resting place in the other world until they have been atoned for, as it were, by fires of burnt captives." The Ontoagannha spoken of by the Jesuit Father were the warlike Shawnees who at that time occupied the extreme western portion of Kentucky and were the only Indians within its borders.

The specimens of chipped stone found in Kentucky are almost always made of the various forms of chalcidonic rock which are popularly termed flint, and the name "flints" here, as elsewhere, is used to designate all implements made of this material.

In the art of chipping flint the prehistoric men of Kentucky exhibited a rare degree of manual skill. One

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can not but marvel at the long, broad, and regular flaking displayed in much of their work. In the author's collection is a spearhead of dark brown jasper, from Warren County, seven inches in length, leaf shaped, with indented base. From either face have been struck off slender flakes, extending in parallel lines the whole length of the implement. The edges, by a series of smaller chippings, have been fashioned into the most graceful lines. Along the middle line the specimen measures scarcely more than one eighth of an inch in thickness, while between this and the edge it reaches a thickness of nearly three eighths of an inch. Such marvelous skill as is here exhibited extorts for the aboriginal arrow-maker our wonder and admiration, and arouses a desire to know something of the methods by which these interesting relics were wrought.

Many of the early explorers and travelers have described the art of working flint among the historic Indians. Captain John Smith, in describing the making of arrow-points by the Virginia Indians in 1606, says: "His arrow he maketh quickly with a little bone which he ever wearest at his bracer, of a splint of a stone or glasse in the form of a heart and these they glew to the end of their arrowes." Catlin, in his "Last Rambles Amongst the Indians," thus describes the mode of making flint arrow-points among the Apaches: "Like most of the tribes west of and in the Rocky Mountains they manufacture the blades of their spears and points for their arrows of flint, and also of obsidian, which is scattered over those volcanic regions west of the mountains; and, like other tribes, they guard as a profound secret the mode by which the flints and obsidian are broken into the shapes they require. Every tribe has its factory in which these arrowheads

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are made, and in those only certain adepts are able or allowed to make them for the use of the tribe. Erratic bowlders of flint are collected (and sometimes brought an immense distance), and broken with a sort of sledge hammer made of a rounded pebble of hornstone set in a twisted withe, holding the stone and forming a handle. The master workman, seated on the ground, lays one of these flakes on the palm of his left hand, holding it firmly down with two or more fingers of the same hand, and with his right hand, between the thumb and two forefingers, places his chisel (or punch) on the point that is to be broken off; and a co-operator (a striker) sitting in front of him, with a mallet of very hard wood strikes the chisel (or punch) on the upper end, flaking the flint off on the under side below each projecting point that is struck. The flint is then turned and chipped in the same manner from the opposite side; and so turned and chipped until the required shape and dimensions are obtained, all fractures being made on the palm of the hand. . . . The yielding elasticity of the palm of the hand enables the chip to come off without breaking the body of the flint, which would be the case if they were broken on a hard substance. These people have no metallic instruments to work with, and the instrument (punch) which they use I was told was a piece of bone; but on examining it I found it to be a substance much harder, made of the tooth (incisor) of the sperm whale or sea lion, which are often stranded on the coast of the Pacific. This punch is about six or seven inches in length and one inch in diameter, with one rounded side and two plane sides, therefore presenting one acute and two obtuse angles to suit the points to be broken.

“ This operation is very curious, both the holder and

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the striker singing, and the strokes of the mallet given exactly in time with the music, and with a sharp and rebounding blow in which, the Indians tell us, is the great medicine (or mystery) of the operation."

Schoolcraft ("North American Indian Tribes," Volume III, page 467) writes as follows of the manufacturing of arrow-points by the Indians: "The skill displayed in this art, as it is by the tribes of the entire continent, has excited admiration. The material employed is generally some form of hornstone, sometimes passing into flint. This material is often called chert by the English mineralogists. No specimens have, however, been observed where the substance is gunflint. This hornstone is less hard than common quartz, and can readily be broken by contact with the latter. Experience has taught the Indian that some varieties of hornstone are less easily and regularly fractured than others, and that the tendency to a conchoidal fracture is to be relied on in the softer varieties. It has also shown him that the weathered or surface fragments are harder and less manageable than those quarried from the rocks and mountains.

"To break them, he seats himself on the ground and holds the lump on one of his thighs, interposing some hard substance below it. When the blow is given there is a sufficient yielding in the piece to be fractured not to endanger its being shivered into fragments. Many are, however, lost. After the lump has been broken transversely it required great skill and patience to chip the edges. Such is the art required in this business, both in selecting and fracturing the stones, that it is found to be the employment of particular men, generally old men, who are laid aside from hunting to make arrow and spearheads."

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"The Viard arrow-maker," says Stephen Powers, "takes a piece of jasper, chert, obsidian, or common flint, which breaks sharp-cornered, and with a conchoidal fracture; this he heats in the fire and then cools slowly, which splits it in flakes; then taking one of these flakes, he gives it an approximately right shape by striking it with a rough hammer; then slips over his left hand a piece of buckskin with a hole to fit over the thumb (this buckskin is to prevent the hand from being wounded), and in his right hand he takes a pair of buckhorn pincers, tied together at the point with a thong. Holding the piece of flint in his left hand, he breaks off from the edge of it a tiny fragment with the pincers by a twisting or wrenching motion. The piece is often reversed in the hand so that it may be worked away systematically. Arrowhead manufacture is a specialty, just as arrow-making, medicine, and other arts. These pincers are probably only our compound chipper." (Smithsonian Report, 1886, Otis T. Mason.)

These descriptions of the methods of making flint among the modern Indians will throw light on the methods employed by the prehistoric men of Kentucky, yet none of the historic tribes seem to have possessed the high degree of skill attained by the ancient flint-workers of Kentucky and Tennessee. Especially is this true of the manufacture of the larger and finer implements which are found in considerable numbers in parts of this State, and in even greater numbers in Tennessee. So far as the writer knows none of the modern tribes made implements comparable in either size or beauty with the fine specimen shown on page 160.

Doctor Abbott (Primitive Industry, page 248), speaking

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of these large spearheads and commenting on their rarity among the historic tribes, refers to an Indian chief declaring one seven inches long to have been an implement belonging to his ancestors, and then asks, "Is it probable that they had been discarded in great measure at some remote period and were veritable relics of a distant past when the European settlers first reached our shores? The absence of direct reference to these characteristic implements seems indicative of this." It does not seem improbable that the fine ones of sword-like form were themselves prehistoric to the red men at the time of their first contact with the Europeans.

It is almost impossible to satisfactorily classify all the smaller flint implements. The simplest method is that used by Mr. Fowke, into stemmed and stemless forms, the former having a prolongation at the base for the attachment of a shaft or handle, the latter being of an oval or triangular shape. Doctor Thomas Wilson, Curator of the Archeological Section of the United States National Museum, in his work "Arrow-points, Spearheads, and Knives of Prehistoric Times," has attempted a more elaborate classification of those used as arrow-points, spearheads, and knives. The specimens in that collection he separates into four grand divisions, according to form. Division I, Leaf Shaped.—This division includes all kinds; elliptical, oval, oblong, or lanceolate forms bearing any relation to the shape of a leaf, and without stem, shoulder, or barb. Division II, Triangular.—This division includes all specimens which, according to geometrical nomenclature, are in the form of a triangle, whether the bases or edges be convex, straight, or concave. They are without stems and consequently without shoulders, though



EARTHEN BOTTLE

Effigy of Beaver. Height ten and one fourth inches. Taylor Collection



EFFIGY VESSELS
From Southwestern Kentucky



Length, thirteen inches



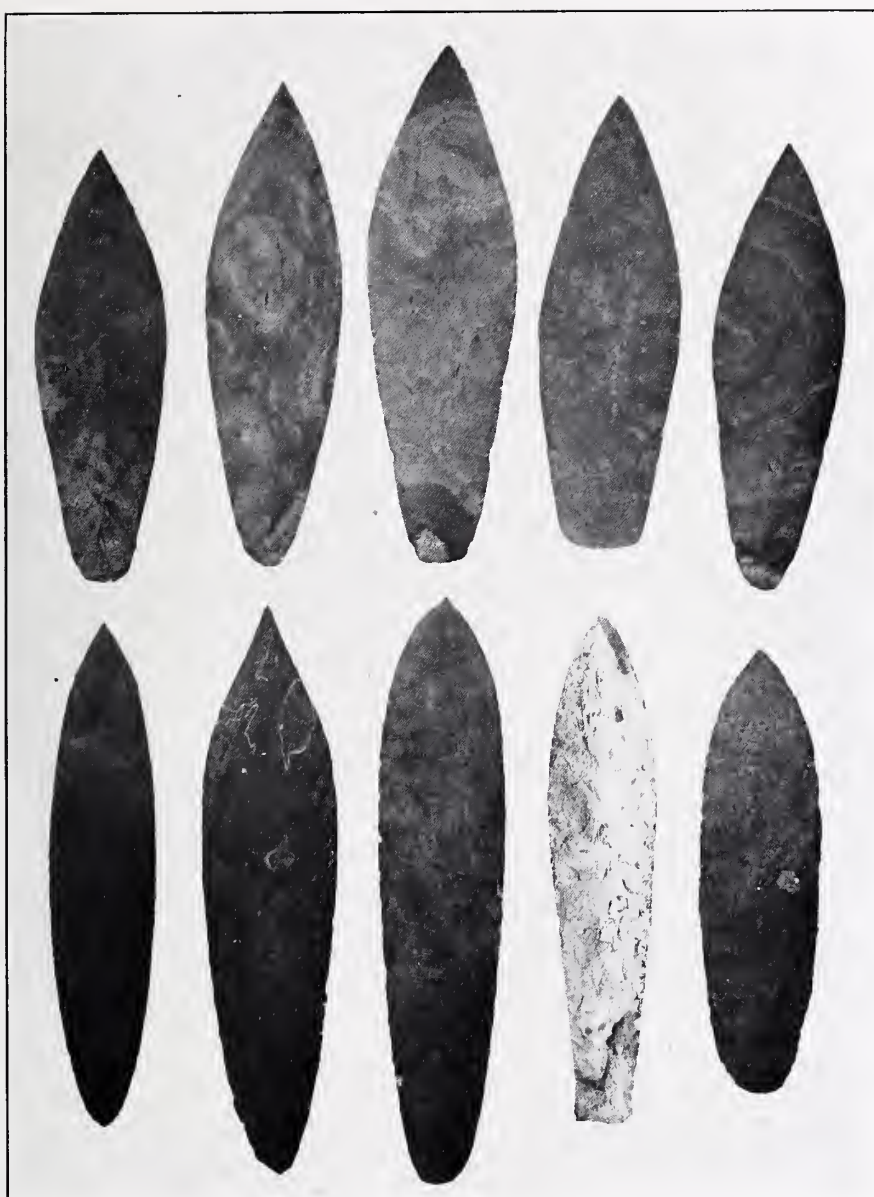
Length, fourteen inches. Johnson Collection

FLINT IMPLEMENTS



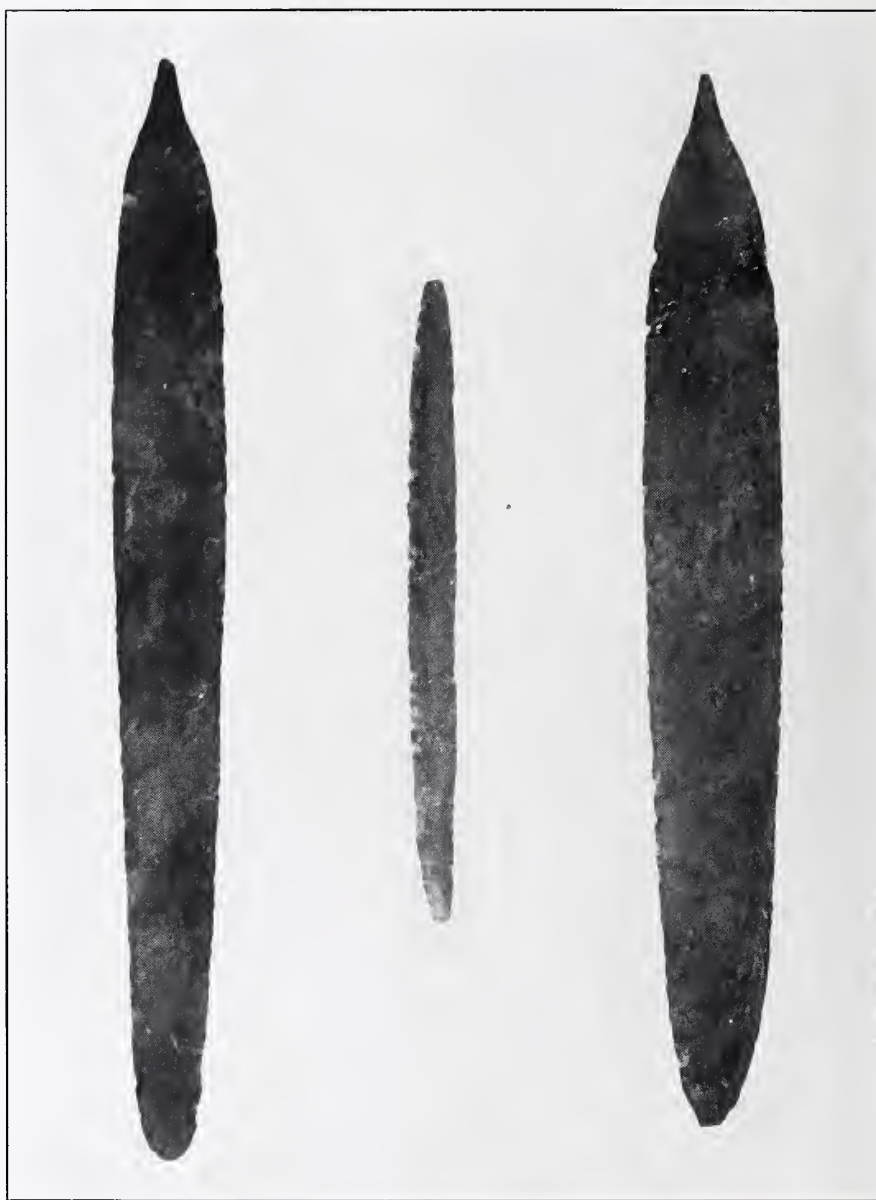
FLINT KNIVES

Found *en cache* at Louisville, Jefferson County



LARGE FLINT IMPLEMENTS .

Upper row part of cache from Livingston County, Kentucky
Johnson Collection



FLINT IMPLEMENTS

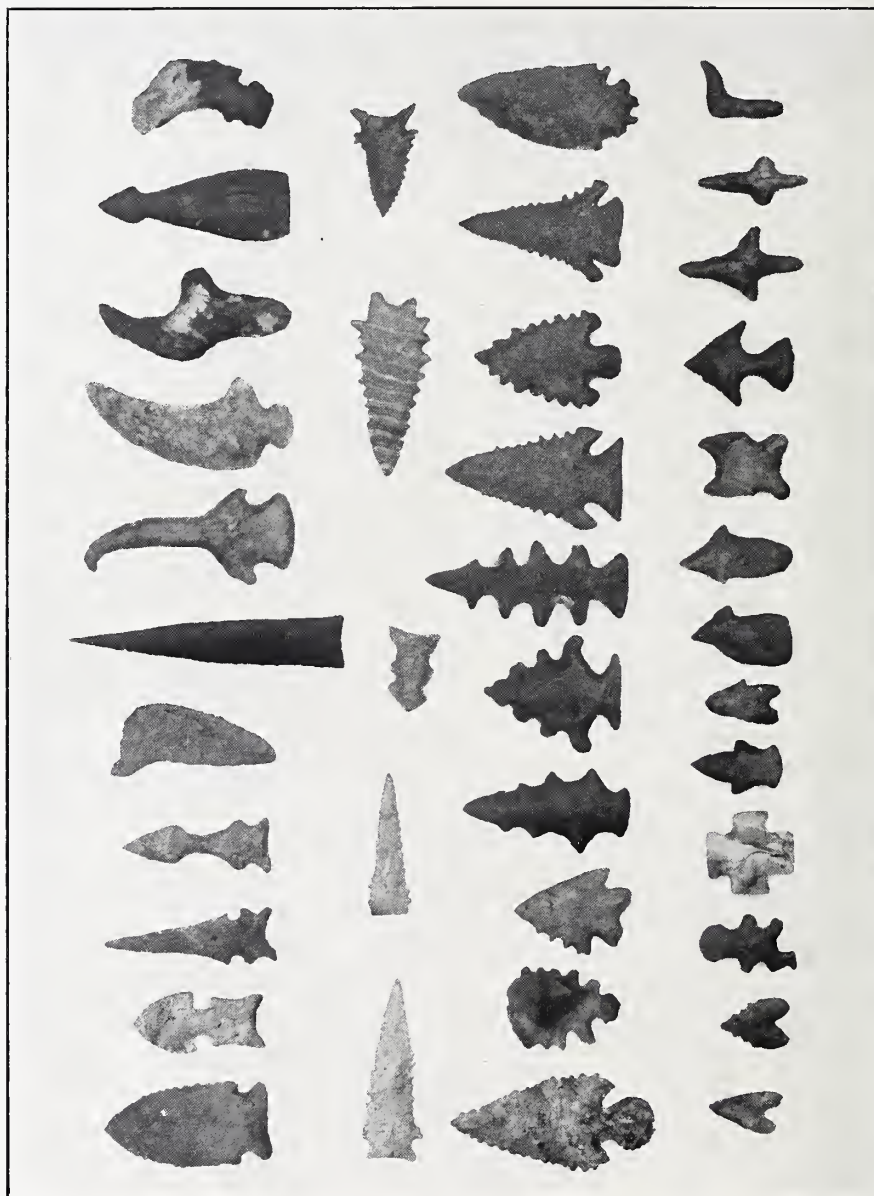
Longest, fourteen inches. From Southwestern Kentucky
Johnson Collection



THREE FINE SPEARS OR KNIVES
Length of longest, eight inches



THREE FINE PERFORATORS OR ARROWS
Length of longest, six inches



ART IN FLINT—ARROW-POINTS OF RARE AND CURIOUS FORMS

Johnson Collection

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in some specimens the extreme concavity of the base produces barbs when the arrow-shaft is attached. Division III, Stemmed.—This division includes all varieties of stems, whether straight, pointed, or expanding, round or flat, except those with certain peculiarities and included in Division IV, and whether the bases or edges are convex, straight, or concave. Division IV, Peculiar Forms.—This division includes all forms not belonging to the other divisions, and provides for those having peculiarities, or specimens which are restricted in number and locality.

Nearly every form illustrated as belonging to Divisions I, II, and III, in Doctor Wilson's admirable work, have their counterparts in Kentucky, and of Division IV those with beveled edge, serrated edge, bifurcated stems, asymmetric forms, perforators, and several of the curious and fanciful types pictured and described therein, were known to the prehistoric men of this State. In describing some of the Kentucky implements we shall follow the classification of Doctor Wilson above given.

Implements of the leaf-shaped variety vary in length from three fourths of an inch to eighteen inches. A specimen from Madison County now in the National Museum measures thirteen inches long, two and a half wide, and three eighths of an inch thick. It is of dark brown flint, and is too large to have been hafted as a spear. It probably served as a dagger or sword. In the writer's cabinet is an implement of somewhat similar shape, of light-colored hornstone from Warren County. It is thirteen inches long, two and three fourths inches broad, and three eighths of an inch thick. The edges are slightly serrated, and what is most interesting, the serrations are set as the teeth of a saw. The object shows unmistakable signs of use;

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many of the points are broken, and the edge displays slight traces of polish, such as would be caused by constant friction. The writer believes that this flint was used as a saw. In tests made upon green wood it answered that purpose admirably. For quite a while it was difficult to understand how these people cut the handles used in mounting their spears and axes, but latterly a number of saw-like flints have been found, and upon examination it is shown that they can be used successfully in cutting any timber the size of which is less than an inch in diameter. With a stone ax this could not be done satisfactorily, as the blunt implement, by mashing and bruising the fibre, generally would have rendered the material unfit for use. A small specimen from Christian County shows unmistakably that it was a saw. It is rectangular in form, four inches by one and one half inches. Along one edge the saw-like serrations, though small, are very pronounced. Several other specimens have been found in Madison, Woodford, and Mercer counties. In Trigg County was found a flint disc two inches in diameter, serrated around the whole circumference. In all specimens that appear to have been designed as saws the teeth are small. The larger implement described above is one of the handsomest pieces of flint work we have seen. The flaking is long, broad, and regular, the work of a master hand. (See page 157.) In the collection of Mr. H. L. Johnson are several long, slender specimens from Southwestern Kentucky. They are similar in form and material to several described by General Gates P. Thruston in his "Antiquities of Tennessee." The longest, from Trigg County (page 160), measures fourteen inches. It is made of the brown chert observed in specimens from Stewart

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County, Tennessee. The delicate, needle-like form on same page is one of the most unusual we have observed. It is eight inches in length and was found in the southwestern part of the State. In Breckinridge County, not far from Hardinsburg, was found an implement of willow-leaf shape, sixteen inches long and five broad, made of white cherty limestone.

It would seem that the larger flint implements, especially those of the form illustrated on page 160, and those from Tennessee, one of which, now in the Museum of the Missouri Historical Society, measures twenty-seven inches, are too delicate and fragile for use in the domestic arts or as weapons of war, but had a peculiar ceremonial and religious value in the eyes of the primitive men, and should be classed with the ceremonial hooks, sceptres, *et cetera*, which are illustrated on pages 188 and 189. May they not have been emblems of authority or swords of state, perhaps borne by the medicine men or shamans in their incantations and ceremonial dances? Reference to such implements among the modern tribes may perhaps throw some light on these wonderful specimens from Kentucky and Tennessee. Otis Mason, writing of the Hupa Indians of Northern California (Smithsonian Report, 1886, Part 1, page 222), says: "That among the articles paraded or worn in the dance is a flake or knife of obsidian or jasper, some of which are fifteen inches or more in length, and about two inches and a half wide in their widest part. These are wrapped in skin or cloth to prevent the rough edges from lacerating the hand, but the smaller ones are mounted in wooden handles and glued fast. The large ones can not be purchased at any price, but Mr. Powers procured some about six inches long at two dollars and

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fifty cents apiece. These are not properly knives, but jewelry, for sacred purposes, passing current also as money." Mr. Powers, in describing the weapons of war of the Yurok Indians of California, says that they formerly used large jasper and obsidian knives, but "which, nowadays, are kept only as ornaments or objects of wealth to be produced on occasions of a great dance."

Page 158 illustrates a type of leaf-shaped implement of unusual interest. These were taken from a cache of seventeen in Louisville. The average size is five and a half inches by two and one fourth; they are extremely thin, and the chipping exhibits great skill. The material is chert of light bluish cast. Near the base of each of these implements are notches, as if for ligatures, which suggest that they were mounted as knives or daggers. They are too fragile for service as spearheads or projectiles. The edges of several are convex for the greater distance, then become slightly concave near the point, thus giving a needle-like point. Doctor Wilson says such forms are extremely rare. Mr. Moorehead says they are peculiar to Illinois, Michigan, and Canada. With the exception of a smaller specimen from Christian County, these are the only examples of this type we have seen. The larger implement on the same page was found in Whitley County. It, as the others, was probably used as a knife. The edges display slight fractures, such as would come from use. It measures eight and one half inches in length by two and three fourths at its widest point, and is about three eighths of an inch in thickness.

Triangular arrow-points are found all over the State. The northeastern portion has yielded large numbers of the smaller forms with straightened base. They are

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generally from three fourths of an inch to two inches in length, and are commonly termed war points. In the middle and western parts of the State they are not nearly so numerous. The most interesting and the rarest of the triangular forms of flint implements are those with beveled edges. Occasionally serrated specimens are seen. The triangular types in Kentucky rarely exceed eight inches in length.

Flints belonging to the stemmed division are distributed in almost equal proportions over the Commonwealth. However, there are variations of form which seem to be largely confined to certain sections. The presence of the stem in this class of implements presupposes some method of attachment to a shaft or handle, according as the instrument was used as an arrow-point or spearhead, knife or scraper. These vary in size from less than half an inch in length to fourteen inches. Many of the smaller points are as delicately wrought as those from the Western coast, and in them the ancient flint-worker employed the most beautiful and rarest materials available. The largest specimen known is in the collection of Mr. H. L. Johnson. It measures fourteen inches, and is beautifully made of dark brown flint. It is a masterpiece of the flint-chipper's art. (See page 157.) In the author's collection is a specimen of light colored chert four inches by one and one fourth inch by one fourth inch. The flakes, which extend entirely across the blade, are parallel and of equal width. Without the specimen before one, such wonderful skill in striking off with perfect regularity flakes the same length and breadth from such refractory material as flint would seem almost unbelievable.

A very interesting class of flint implements are those

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of beveled form. The blades of the ordinary arrowheads are worked from both sides, so that the ends of the flaking meet near the center line, but in this class, the chipping by which the edge is formed is all done from one side, the edge being beveled to the opposite face. Several suggestions have been offered as to the purpose of thus shaping these implements. Doctor Wilson, in order to determine the truth of the matter, inaugurated a series of experiments, and after most careful tests came to the conclusion that they were beveled in order to give a revolving motion to the arrow-shaft while being propelled through the air. He began his experiments by mounting one of these beveled points upon a shaft and letting it drop straight to the ground from a high building; then, by throwing the arrow off, in every direction, finding a universal rotation. He carried his experiments further by arranging these specimens, mounted on a shaft, in a sort of clamp of wire, the implement being free to rotate in either direction with the application of the slightest force. This machine was used by pushing it with its clamped arrow rapidly through water in a large tub, and it was discovered that the resistance offered by the water caused the implement to rotate. A more conclusive test was made by suspending the shaft, the point foremost, over the air-pipe of a driving fan, the current from which immediately set it revolving. After these experiments there can be no question that the beveling of an arrow-point would cause the shaft, when propelled from the bow, to revolve in its flight through the air, and it may be that this was the purpose of the prehistoric man in thus forming the blades of many of his flints. But it is true that the same result could be accomplished, and

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more easily and effectively, by twisting feathers spirally upon the shaft, an expedient which was well known to the modern Indian and is mentioned by Schoolcraft, Powell, Morgan, and Cheaver.

This discovery of the use of beveling by the prehistoric men was the discovery of a most important mechanical principle. It could only have been reached by much study as well as experimentation. It is really the beginning of the principles now involved in rifling small firearms and artillery. Modern man has discovered that the rotary motion is an efficient agency in both penetration and accuracy of movement of projectiles. The prehistoric man found out the same principle, and applied it in the beveling of his arrow-points. It is true that he produced the same rotary motion by feathering his shaft according to a particular form, but the rotary movement which would come from beveling in stone would be far more difficult to work out than that which came from the placing of the feathers spirally on the shaft. There would be no difficulty in the arrow-manufacturer reaching the conclusion that serration or barbing was important. His object was to injure either the animal or the man into which the arrow-point was fired. These features would cause the arrow to become more firmly imbedded in the flesh, to remain more permanently, and render its removal more dangerous and painful. But the idea of fashioning a stone by shaping the sides in a particular way so as to make it, when attached to the arrow-shaft, revolve in its movement through the air, would be really the most difficult task. There are many discoveries about which there is no wonderment. They are so easy and natural and readily understood that we can see at once that the forms into which

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they were manufactured would require no great degree of skill nor much lengthened observation. Whether this beveling system was discovered by accident or evolved after careful and patient study we can not say, but whether it came in either way, it was a great step forward, and enabled the men who fired the arrow to propel the projectile with much greater force and at the same time with far more precision. And in looking back over the results of either the experimentation or the discovery by accident of this great principle, we can not but feel a high degree of admiration for the genius and the skill of these prehistoric people in this remarkable phase of discovery and manufacture.

While many of the beveled implements found in Kentucky were designed for arrow-points, yet a great many are too large and heavy for such use. It is hardly likely that the Indian would have beveled a spearhead in order to give a rotary motion to the shaft when hurled, nor is it likely that the larger beveled implements were used as projectile points at all. In the author's collection are several beautifully and delicately wrought, measuring as much as eight inches in length. (See page 161.) It is more likely that these were used as knives or daggers; and then the question arises, why beveled? It has been suggested with some reason that many of the larger beveled flints were used for skinning game, as they are better fitted for this than anything else. The beveling almost invariably being to the right, is such as would be necessary if the implement were held in the right hand and drawn toward the user. A peculiar feature of a large number of the beveled flints is that the bases are smoothed or polished. Sometimes it seems that this polish is due to

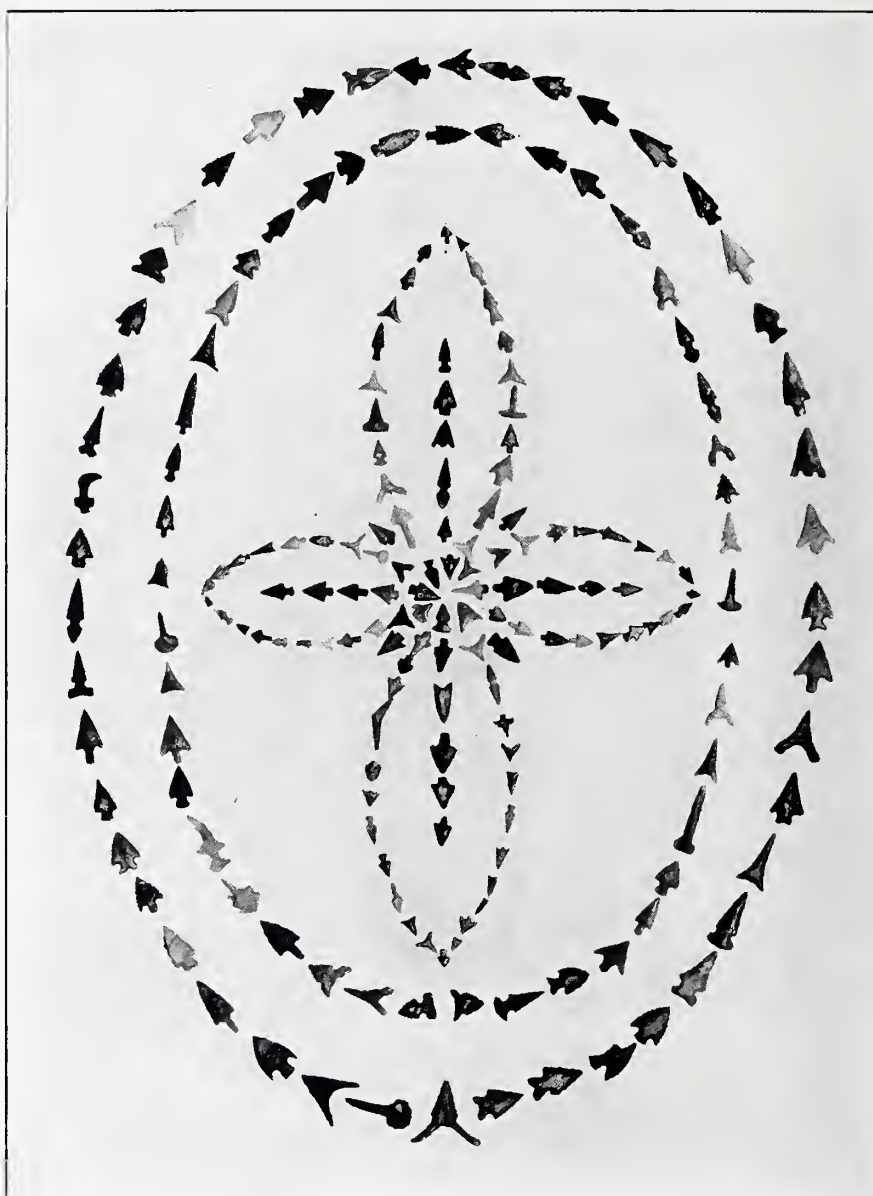
Kentucky Art In Flint.



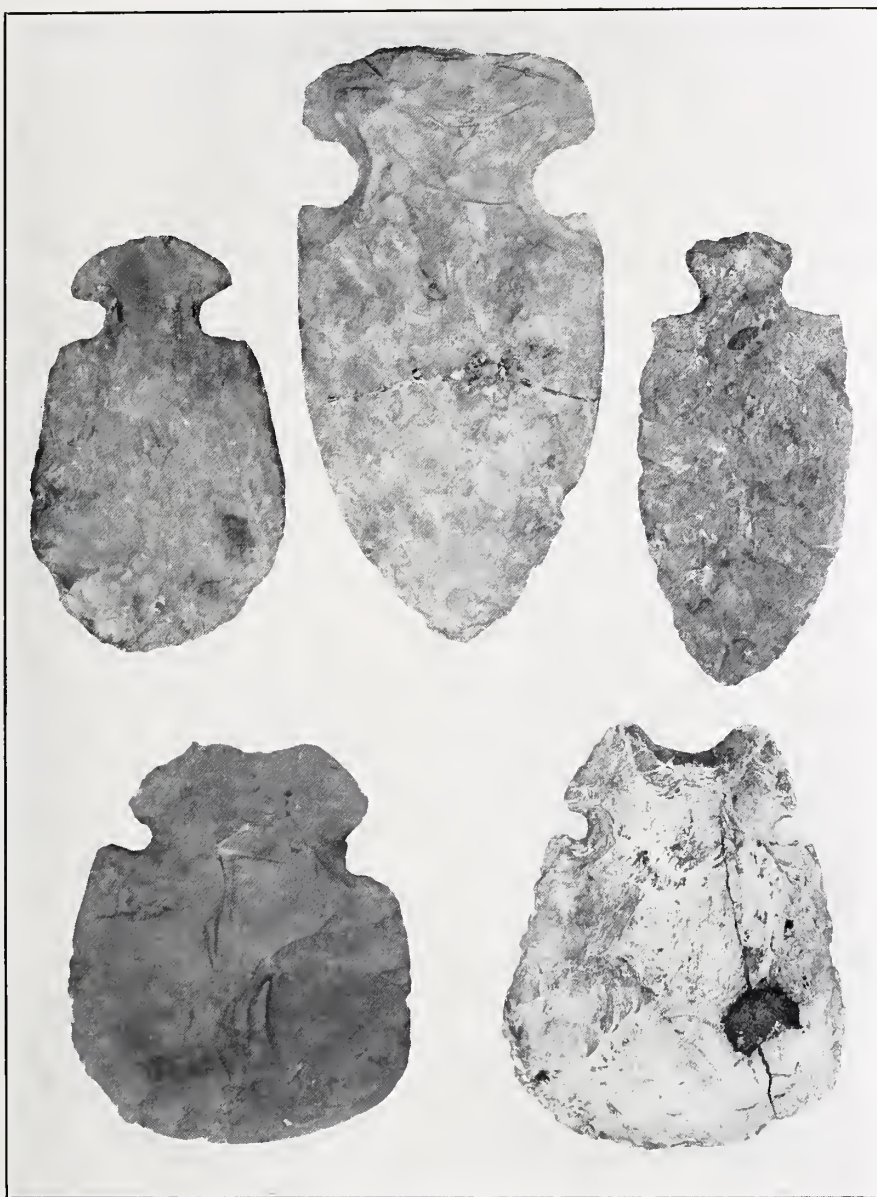
Collection of Rare Forms.

ART IN FLINT—RARE FORMS

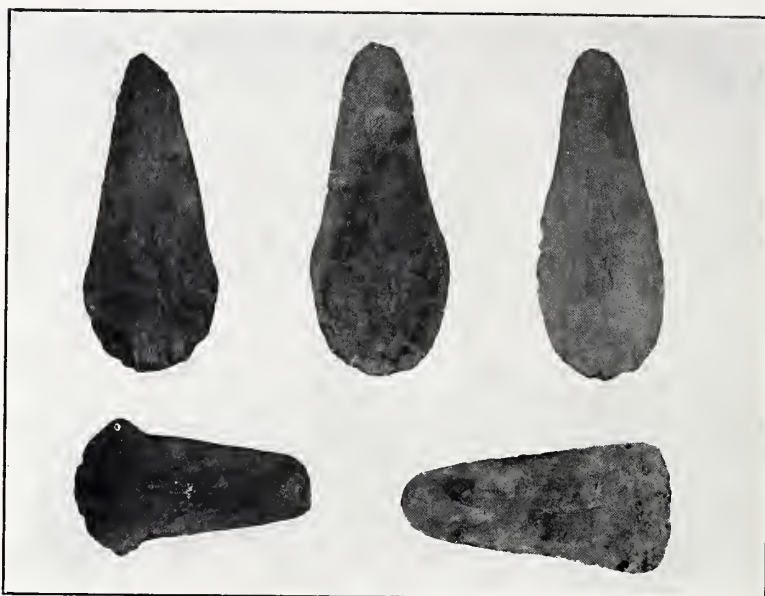
From Kentucky



SMALL ARROW-POINTS OF RARE AND ELEGANT FORMS
From along Tennessee River. Largely from State of Tennessee



FLINT HOES, NOTCHED
Largest, $\frac{1}{2}$ nine and one half inches



FLINT SPADES

Length of longest, thirteen and one half inches



FLINT SPADES

Length of longest, seventeen and three fourths inches
Fulton County, Kentucky. W. P. Taylor Collection

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the fastening in a shaft, or handle. Again, especially in the larger points, it clearly appears that it was given intentionally. In the author's collection of nearly a thousand beveled points the beveling is to the right in all but one specimen.

Flints of asymmetrical form are seen in every large collection. Several are illustrated on page 162 from the collection of Mr. H. L. Johnson. While many of this class appear to be arrow-points, yet their usefulness as projectiles is largely destroyed by their lopsided feature. It is likely that the majority were affixed to short handles and used as knives or scrapers. Indeed, the edges of many show unmistakably that such was their use.

There are few more beautiful and curious forms than the little spiral points illustrated on page 171. These could not have been so fashioned for any utilitarian purpose, but appear the result of a mere whim or fancy of the old flint-chipper as he toyed with his art. They have been fancifully termed hairpins, and the largest one was obtained by the author from the back of a skull in a mound burial.

The so-called drills or perforators are found in large numbers. Many show both by the form of the pile or bore and the unevenly worked base that they were designed for drilling purposes. But in a large number the base is carefully finished, frequently stemmed and sometimes provided with barbs. One of the most beautiful of this class that has fallen under our observation is illustrated on page 161. This delicate implement was certainly not designed as a drill. Together with the others there shown, it was found on the great buffalo trail which led from

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Memphis, Tennessee, up through Kentucky to the salt springs at Blue Lick. It is exactly six inches in length, beveled, and exquisitely wrought. The second largest measures five inches, while the third is four and one half inches. If used for the killing of buffaloes, as the author thinks they were, these flints are probably the product of the arrow-makers of Tennessee or of those north of the Ohio, and were lost by some of the numerous hunting parties which ranged this State subsequent to the appearance of the buffalo, when no red man dared make his home in the "Dark and Bloody Ground." No implements made of the bones of the buffalo have been found in the mounds or graves of Kentucky, and no traces of the animal's presence occur among the remains of the people of the earliest human stages in this State, although the bones of the ordinary game animals, such as would be eaten by the Indians, are found about every ancient village site. Mr. Allen thinks that the appearance of the buffalo was comparatively recent, and like an eruption in suddenness. It certainly occurred after the red man had abandoned the mounds and earthworks and no longer made his habitation here. In the early part of the last century a buffalo trace worn deep into the soil until it resembled a railroad cut was to be seen passing directly through an ancient earthwork remain in Mason County.

Knives of flint played an important part in the industrial life of the red man. With them he fashioned his bow-staves and arrow-shafts, skinned game, and did a hundred other things requiring a cutting edge. Many of the implements commonly thought arrow-points and spearheads were affixed to short handles and used as knives. The ordinary flint might have served equally as well as arrow-

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point or spearhead, knife or scraper, according as it was mounted on a shaft or set in a short handle. The Indians of Southern Utah as late as 1875 used as knives flint blades identical with the typical arrow-point and spearhead, fastening them in short wooden or bone handles. It is impossible to determine exactly where the knife begins and where the projectile point ends. A cutting edge is the absolute requisite of a knife. Many arrow-points and spearheads furnished this, and unworked flakes of flint might answer equally as well as the finished product. Some implements, however, show by their form that they were designed solely as knives. On page 185 is shown one of this type with a smoothly ground or polished blade, from the collection of Mr. Johnson. The writer has two of similar form; also a leaf-shaped knife eight inches in length, which shows about the base unmistakable marks of having been hafted.

BUNTS.

An interesting class of the smaller flint implements are those called bunts. These are usually of the form of the stemmed arrowhead, but are squared or rounded instead of being pointed. Many appear to have been made from broken or rejected arrowheads by working off the point. Usually this was all done from one face, giving the implement a beveled edge. Sometimes the chipping was done from both sides, bringing the edge in line with the center of the implement. Many of these objects doubtless served as scrapers; others may have been attached to arrow-shafts and used in killing small game when penetration was not desired. It has been

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suggested that they were used as arrowheads in target practice, but if this be true it is strange that none show chipping or fracture about the edge, which would necessarily come from impact with a hard substance. Some are seen having a polished or glazed edge, such as might be produced by use as scrapers, as the writer thinks most of these implements were. Southern Kentucky has been prolific in these objects.

Some years since a gentleman in Franklin County was kind enough to secure for the author a large number of this particular form. He collected at one time between three and four hundreds of these little specimens from along the Kentucky River in Franklin and Anderson counties. In other parts of the Bluegrass these bunts are comparatively rare, and why in this particular locality, covering a space of thirty-five miles along the Kentucky River, they should have been found in such abundance is a puzzling problem. It may have come from the fact that the men who lived in Franklin and Anderson counties at some particular time of the prehistoric period in Kentucky were largely engaged in tanning, or in some particular form of preparation of skins which would require a large number of these bunts. Up to the time of the sending of this box by this gentleman, very few specimens of this character had come into the writer's possession. But the party sending these was a most reliable collector, and had been moved in gathering this large number by a grateful recognition of a slight favor which had been shown him. The finds of pieces of tanned bearskin and deerskin in caves in Kentucky indicate that these people understood in a somewhat unusual degree the preparation of skins for blankets, coverings, or cloth, and in the curing of these

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skins these bunts probably played an important part. For these curious implements the manufacturer used broken arrowheads, and the arrowheads of sufficient size to produce a rounded surface large enough to render them helpful in scraping and cleaning skins, where they had been broken and rendered useless for other purposes, were changed by these people into these blunt or rounded points, thus economizing the material from which arrowheads were made and utilizing implements which would otherwise have been worthless and would have necessarily been thrown away.

AGRICULTURAL IMPLEMENTS.

The agricultural implements used by the prehistoric men of Kentucky were less numerous than their weapons of war. They consisted of two sorts of spades and one form of hoe. These implements were almost entirely made of flint. Now and then other stone was used, but very infrequently. Those which we may call elongated spades ran in size from six to eighteen inches, and in width of blade from four to seven inches. The chipped flint ones would have a thickness of about three fourths of an inch. Figures showing these spades will be found on pages 173 and 174. They were mounted in two ways, first with the handle at right angles to the blade and fastened as were the axes, or they were arranged as are spades of the present time, so that the handle extended in a line parallel to the blade. The second form was rounded or oval rather than elongated, and with a cutting edge all around. These spades would usually be six inches by seven, and thinner at any given point than the elongated spades.

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These could be mounted as the larger spades, either with the handle extended from the blade straight out, or placed at right angles to the blade, and fastened with a withe or rawhide. Then, third, a notched hoe. These were probably mounted with the handle at right angles to the blade.

Large numbers of these implements had been worn perfectly smooth at the edge by friction. They would be considered unsatisfactory and cumbersome compared with the modern steel and iron hoes or spades. They were used more to loosen the ground than to dig it. The flint blade would be driven into the ground, and probably turned in part so as to place the earth in such a position as to receive moisture, worked sufficiently to destroy the weeds, and kept loose, that the roots of the vegetables might find ready opportunity to spread out under the surface.

Most of the cultivation done by these people was along the river bottoms, where these three styles of implements would be more efficient than if used on the hillside or in the clay ground. In the loam and sandy soil of the river bottoms they would be quite effective. The crops which they grew would be amenable to the treatment described, and in the kind of soil which they cultivated produce prolific yields. Pumpkins, squashes, corn, beans, sunflowers, melons, potatoes, and tobacco, while not as thoroughly cared for as with our hoes and other steel implements, would by this process find sufficient loosening of the earth, and the soil would be made sufficiently receptive to give good growth. The tobacco found in Salts Cave shows that the leaf was large, and the corncobs found in the same place, one of which measures eight and one half inches, show that agriculturally good results

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were obtained from this meager stirring of the ground. Some one might suggest that these corncobs had been carried into the cave at a later date, but they were found around the fires and mingled with the sticks of wood and were partially burned, and about these fires were the gourd plates, cloth, slippers, and other material which had been used by these prehistoric people in the manufacture not only of their clothing but of their implements, and they were mingled in such a way with the daily life of the cave men as to show that these cobs were contemporaneous with the other articles found.

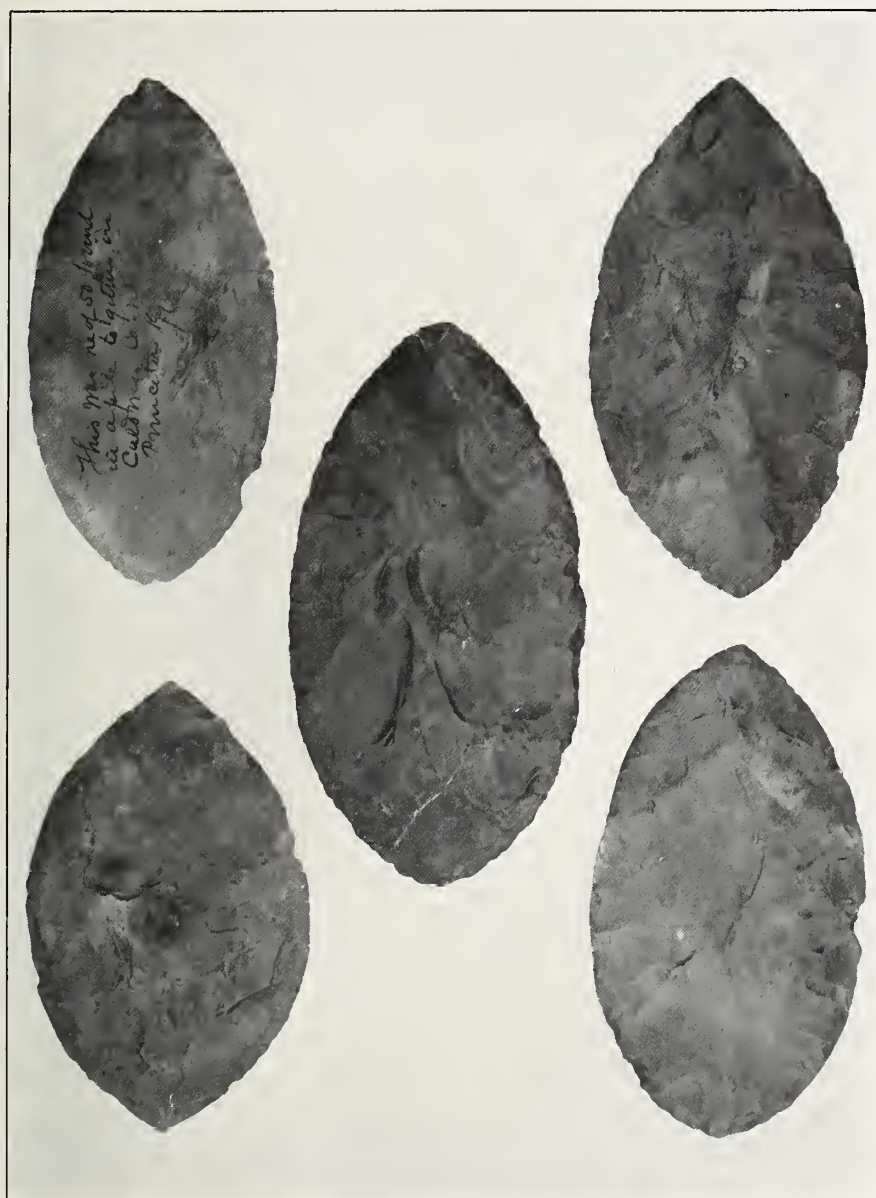
Another instrument used in agriculture was a short stick fashioned so as to make a hole in the soil, into which plants such as tobacco could be dropped. They were curved at the top, with a point running down about eight or ten inches.

It will thus be seen that the things they used in producing great crops, of which we have an occasional account, were simple and crude, but judging from results, effective. Squashes were equal in size to many that we grow in the present day. Their gourds were quite as large as those which are grown now, and those used for water jugs were larger than anything of the gourd family that is grown to-day, with the exception of the sugar-trough variety. In the later crops of corn these implements would be productive of good results. In the early spring, as agriculturists know, it is more difficult to prepare the soil, which has not been loosened by the spring rains, for the seed planting. But as they had corn covering fully all the seasons which are included in the corn-growing period of the present day, they must have had continuous labor in their crops from April to September.

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CELTS AND CHISELS OF FLINT.

Celts and chisels of flint are common over the whole State, being more numerous, however, and of larger size, in the southern and western portions. They are made of the same material as the arrow-points and other chipped implements. After being flaked into form, the implement was often ground or polished about the cutting edge, and specimens are not infrequently seen where this grinding process has been applied to the whole implement, and so thoroughly and completely as to remove all traces of the fractures made by the chipping. Implements thus polished are shown on pages 185 and 186. Several of these specimens are also remarkable for the broad, flaring blade. Grindstones with which this work was accomplished are found about every village site. They are generally irregular slabs of sandstone, showing the grooves made by the objects, which were laid upon them and moved back and forth until smoothed. This was necessarily a tedious process, as sandstone, the most available abrasive, cuts flint but slowly. To have polished the finer specimens mentioned above must have required hours and even days of laborious rubbing. Page 184 illustrates a number of these implements. The upper row are adz-shaped, having a half elliptical cross-section. The longest measured eleven and one half inches. Chisels of somewhat similar shape, but narrower, are frequently found in the southern and western parts of Kentucky. The lower row are of the common celt form. Two of the finest flint celts we have seen are shown on page 187, from the collection of Mr. H. L. Johnson, and were found in Trigg and Liv-



FLINT IMPLEMENTS

From cache of fifty. Caldwell County
Largest, 9x4 $\frac{3}{4}$ inches



FLINT ADZES AND CELTS, HIGHLY POLISHED
Length of longest, eleven inches



POLISHED FLINT IMPLEMENTS
Length of longest, eight inches. Johnson Collection



POLISHED FLINT CELTS
Length of longest, seven and five eighths inches. Johnson and Taylor Collections



FLINT CHISELS AND CELTS
Johnson Collection



FLINT CELTS, PARTIALLY POLISHED
Length of longer, thirteen inches. Johnson Collection



FLINT IMPLEMENTS—RARE FORMS
From Stewart County, Tennessee, and Trigg County, Kentucky



SCEPTER OR MACE

Length, fifteen inches. Edmonson County
From collection of General Gates P. Thruston



BANNER STONES
From various counties in Kentucky

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ington counties. The longest measures thirteen inches. Trigg County, near the confluence of the Little River with the Cumberland, has been prolific in beautiful little celts and chisels of jasper. Nowhere else in the State have these been found in such large numbers, of such beautiful material, and such complete polish, as in that section.

CEREMONIALS OF FLINT.

The flint objects shown on page 188 are among the most interesting of all chipped implements. It is likely that none of these were designed for a practical use. We think the sickle-shaped, the scepters, and perhaps the other forms, had a ceremonial significance. These are from Trigg County, Kentucky, and Stewart, the adjoining county in Tennessee. General Gates P. Thruston, in his "Antiquities of Tennessee," illustrates and describes many of these problematical objects of flint. The most remarkable is a scepter or mace of flint found in this State, and now in the collection of General Thruston. The illustration on page 189 is taken from his "Antiquities of Tennessee." This wonderful object is fifteen and one fourth inches long and over five inches wide at the points. It is of dark gray chert. General Thruston writes: "I do not believe a finer or more elaborately wrought specimen of ancient chipped stone work than this old mace has ever been discovered." Mr. R. B. Evans, of Glasgow, from whom this scepter was obtained by General Thruston, says it was found many years ago near Chameleon Springs, in Edmonson County, by a hunter who observed the end of it projecting from under a ledge of rock. Two smaller

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scepters or maces are shown on page 188. One is from Stewart County, Tennessee, just across the Kentucky line, and the other from the Rogers farm in Trigg County.

These rare forms in flint seem to be confined principally to the regions along the Tennessee and Cumberland rivers, and appear to be exclusively the work of the ancient people who lived along these streams and who constructed the stone graves of Southern Kentucky and Middle Tennessee.

CACHE FINDS.

Cache finds of chipped implements have not been numerous in Kentucky.

In Boyd County was found a cache containing one hundred and sixty-five specimens of the leaf-shaped variety, made of gray flint. The size of these are three and three fourths inches by one and five eighths inches by one eighth of an inch in thickness.

In Todd County, three miles east of Trenton, another cache was found. The number of implements taken from it is not known.

In Union County, near Uniontown, was a cache of one hundred and forty hornstone knives. About six miles above Caseyville, in the same county, two caches were disclosed by high water in 1884. They contained respectively fifty-six and seventy-five specimens, from six to thirteen inches long.

In Caldwell County, about two miles from Princeton, a cache of leaf-shaped implements was disclosed by the plow, fifty in number, and measuring from seven to nine inches in length. While these implements do not seem

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to be specialized, yet they are nicely finished and exhibit a high degree of skill in chipping. Illustrations of these may be seen on page 183.

In Jefferson County, a short distance from the bank of the Ohio, on the farm formerly owned by the late Thomas L. Barret, President of the Bank of Kentucky, there was plowed up a cache of small oval-shaped implements of gray flint, fifty-seven in number. They are all perfect, and doubtless had been placed in such position by either the manufacturer or some trader, who expected subsequently to dispose of them. Just at the head of the channel opposite Sand Island, in the Ohio River, some twenty-five or thirty feet below the surface, were found a large number of flint arrowheads *en cache*, and at the mouth of the Portland Canal, opposite Twenty-ninth Street in Louisville, a large number of flint, together with bone, implements were found at a depth of thirty feet below the natural surface. In High Avenue, at its intersection with Twenty-sixth Street, in excavating for the purpose of laying water-pipes about eighteen years ago, a large number of prehistoric implements were unearthed, among them being seventeen leaf-shaped knives, several of which are illustrated on page 158. With these were found several slate gorgets, bone awls, and needles.

In Christian County, near Julien, several years ago, was found a large cache of leaf-shaped implements, the size and number of which are not known to the author.

In Trigg County, near Cadiz, Mr. H. L. Johnson secured the contents of a small cache of knives. Among them were the five shown in the upper row on page 159. They are delicately wrought of flint of a bluish cast, and are superior in workmanship to any similar implements the writer has seen.

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CEREMONIALS OF POLISHED STONE.

In the stone graves and mounds and upon the surface of plowed fields about ancient village sites have been found prehistoric artifacts in stone, the use of which is problematical, and which, for want of a better name, antiquarians have designated "ceremonials." Many of these interesting objects display the highest phase of Stone Age art. The material, form, and fine workmanship of the great majority suggest for them a non-utilitarian function and indicate in their making long and tedious hours of labor by skilled and tireless hands, seeking with infinite patience to produce a form and finish which would satisfy the cravings of the ancient artist and be a tribute worthy of the great personage by whom they should be borne, or the use, ceremonial or religious, to which they might be dedicated.

As belonging to this class we shall describe those forms popularly known as banner stones, bird stones, boat stones, spuds, crescents, pierced tablets, discoidal stones, and certain other types which seem to have been designed with no utilitarian end in view. It is perhaps true that some of the pierced tablets served a practical purpose; but many were purely ornamental—that is, used for personal adornment rather than as objects of ceremony.

BANNER STONES.

Of ceremonial objects, few are more carefully wrought or fashioned of rarer and more beautiful materials than those designated "banner stones." These have been found all over the State, occurring most frequently in the central

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counties bordering on the Ohio River and along the valleys of the Cumberland and Tennessee. Their forms vary greatly, though in all specimens there are certain fundamental features which enable us to classify with some degree of certainty the objects belonging to the banner-stone type. Usually the two wings or faces are symmetrical, broad, and comparatively thin, the implement being perforated axially with a carefully drilled hole of uniform diameter. The general form resembles somewhat a two-bladed ax; sometimes the blades are narrowed, the implement assuming a pick-like or crescent shape; again the blade, or face, expands into the typical "butterfly stone." The material used in their manufacture also varies, ranging from the homely indurated clay to beautiful quartz, in hardness removed but a few degrees from the diamond. Green banded slate from the glacial drift was most frequently utilized, though the author has specimens of steatite, greenstone, mottled granite, jasper, sandstone, limestone, and quartz.

Many of the perforations in these objects, especially those of the harder stones, show the spiral lines caused by the drill. Several specimens have perforations which are incomplete, each showing a central core ranging from one eighth to one half inch in length, indicating clearly how and by what instrument they were drilled. A hollow cane or cylinder of copper, used with sand or water, would have made a most serviceable instrument in doing this work, and probably was the drill used by the prehistoric man of Kentucky in fashioning these beautiful and curious forms. The aboriginal workman, unlike the modern, finished his implement before adding the perforation. A series of uncompleted specimens in the author's collection

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show that these objects were first battered, pecked, or ground into form, then carefully polished, and lastly drilled.

A number of banner stones are illustrated on page 190. The double crescent-shaped figures, 1 and 3, are rare in Kentucky, but are said to be more common north of the Ohio River. These specimens are made of green banded slate, and were found in Meade County. Figure 5 is a crescent of argillite, beautifully polished, and measures along the outer curve eleven inches, the cross-section being rectangular. It was found in Livingston County, and is considered a unique specimen. Figure 9 is the typical butterfly stone, made of light yellow quartz, containing blood-red veins or discolorations. This stone, with its beautiful colors, attracted primitive man, and it was his favorite material for the manufacture of his finer discoids and other ceremonial and ornamental objects. This specimen was found about twenty years ago in Hancock County. Figure 11 is of the same material, and comes from Oldham County. As the former specimen, it displays a very high degree of manual skill in shaping, polishing, and boring this hard rock. Figure 7 is of greenstone from Franklin County. A more perfectly formed implement is rarely seen. Figures 4 and 6 are of steatite and greenstone, and were found in Madison County. Figure 8 is of jasper, from Livingston County. Figure 13 is of quartz, from Trigg County. Figure 2 is of mottled granite, also from Trigg County. Figures 2, 8, and 13 are from the collection of Mr. Harry L. Johnson.

The purpose for which these implements were made is a puzzle to archeologists. We are informed that none of the historic tribes knew aught of them. Professor

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Warren K. Moorehead cites the fact that more than one hundred and thirty years ago a Delaware Indian gave to an old settler one of these butterfly stones and informed the pioneer that this was carried because he believed that while on his hunting and trading expeditions its possession would bring good fortune. While we do not know the significance which attached to these objects nor the manner of their use, yet we may safely say that they were made for a special and definite purpose and that none of them saw rough or mechanical service. Their symmetrical forms, their rare and beautiful materials, the great skill displayed in their manufacture, the patience and labor necessary to have fashioned them of granite, jasper, and quartz, all indicate that they were held in high esteem by the aborigines, perhaps had a ceremonial or religious significance, or were invested with some supernatural power. From the perforations we may safely assume that they were mounted in some manner, perhaps on the stem of a calumet, or more likely on a staff, and when thus mounted were used as ceremonial maces or batons, and as emblems of authority borne by the chieftains upon occasions of state, by the shamans in their weird ceremonial dances and incantations, or by their generals in battle or war.

BIRD STONES.

Bird stone ceremonials are extremely rare in Kentucky. They are found occasionally about old town sites, but never, so far as we have observed, do they occur in connection with burials. In form and finish they hardly equal similar specimens found north of the Ohio

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River and about the Great Lakes. The term "Bird Stone" applies to a class of objects more or less resembling a bird in form. From the well-defined and almost realistic bird stone these specimens pass through successive forms, gradually losing more and more of their lifelikeness until the straight bar amulet is reached, an object which, without a series of specimens before him, the antiquarian would hardly classify as a bird stone. These relics are usually made of slate, the green banded variety being the commonest material, though specimens of granite and other hard stone are occasionally seen.

Various functions have been assigned to these puzzling objects. It has been suggested that they were used in playing games; that they were talismans or totems of clans or tribes. Gillman (Smithsonian Reports, 1873, page 371) was informed by an aged Chippewa that "in olden times these ceremonials were worn on the head of Indian women, but only after marriage." Gillman thought these bird stones may have symbolized the brooding bird. Mr. Holmes thinks that they were probably worn by men, rather than by women. Professor Moorehead believes that many of the perforated tablets, especially those of flat form with double perforations, were not suspended as ornaments, but served as bases for holding effigies or ornamental objects, and that many bird stones may have been mounted in this manner. We can offer no suggestions as to their use. In none of the specimens from Kentucky do the holes show signs of wear, such as would be caused by friction with a cord, if suspended, or even mounted upon a pierced tablet as a base and attached thereto by a string.

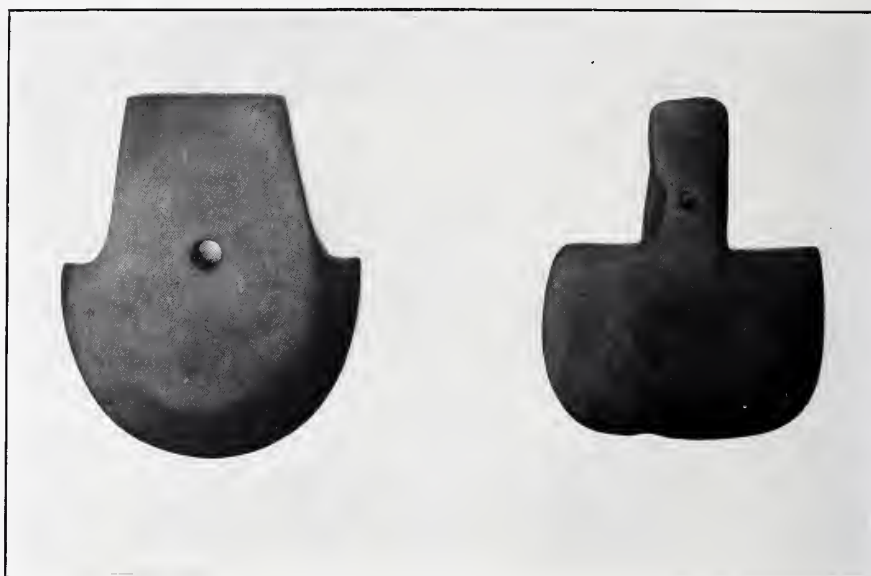
Page 199 illustrates several specimens from this State



BIRD STONES

Kentucky and Indiana

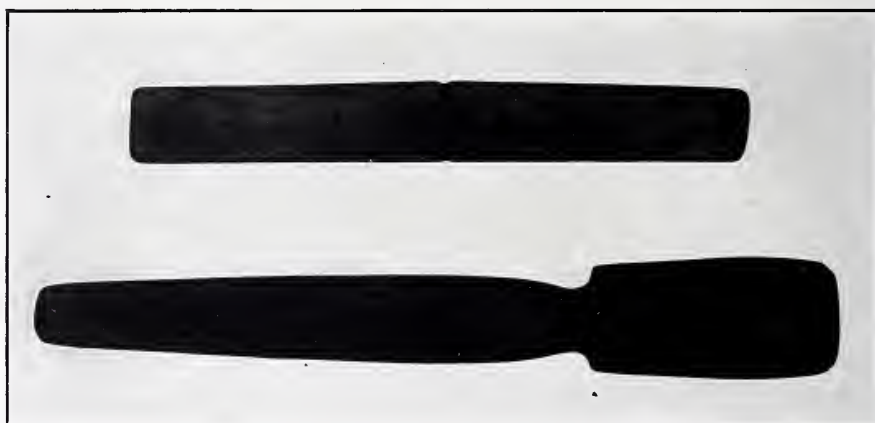
From collections of H. L. Johnson and of Author



1
Green Stone

SPUDS

2
Cannel Coal



SLATE IMPLEMENTS

Lengths, twelve and fifteen and one half inches



SPUDS

Length of longest specimen, seventeen and one half inches;
shortest, three and one eighth inches
From counties on Cumberland and Tennessee Rivers



PIERCED TABLETS

Slate and Steatite. Largely from Jefferson and Meade Counties, Kentucky

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and Indiana. Mr. Charles Patz, of Jeffersonville, Indiana, has a beautiful one of mottled granite, the head resembling that of a bird, the eyes being represented by protruding knobs, the body being of a turtle-like form. It was found on the banks of the Ohio River, in Jefferson County.

SPUDS.

Another class of objects, the use or function of which is enigmatical, comprises certain spade-like implements known as spuds, made usually of some soft material, as argillite. None of these observed by the author show any signs of having served a practical end in the arts and industries of the primitive Kentuckian. While slate is the prevailing material used in their manufacture, harder stones were occasionally employed. These implements are usually highly polished and display a correctness of detail and symmetry of form which places them among the more artistic productions of aboriginal art.

Early writers suggest that these spuds were agricultural implements. Others think them bark peelers, and still others hold that they were used in dressing hides. But if designed for any of these purposes, some of the implements would certainly have about their edges that smoothness and polish which comes from friction in use, a feature which is lacking in every specimen we have seen; and, moreover, the majority of these objects are too delicate and fragile, and the material of many of them too soft, for any of the suggested uses. We think they were not designed for any utilitarian function, but that they are properly classed as ceremonials; that they were maces or

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emblems of authority, perhaps related in symbolism to the banner stone.

There are two classes of implements designated spuds; first, those with blades circular in outline, sharp or round shoulders, and flat, short stem, always pierced. Second, those with the stem or handle rounded, long, and tapering, the stem being very much longer than the blade, which is semi-circular or semi-elliptical. Page 200, Figure 1, shows one of these implements of the first class. It is made of greenstone, and has a neatly drilled hole through the stem. Below this hole and extending around the stem are marks, or discolorations, clearly indicating that the implement, at one time, had been hafted to some sort of handle. It was found in Tennessee, near the Kentucky line. Another of cannel coal from the eastern part of the State has a dull, rounded blade and pierced stem. This implement could not have served any practical purpose, but was probably ornamental or ceremonial. (Figure 2, page 200.)

Spuds of the second class are among the most symmetrical of the works of the red man. They are beautifully finished and made of a variety of materials; usually of slate, more rarely of greenstone. They vary in length from three and one half to seventeen inches. The blades are semi-circular or semi-elliptical, usually with squared shoulders, but in some specimens the shoulders are slightly barbed. A striking feature of many of these is that the blades are notched, an equal number of notches being on either side, ranging usually from one to seven. In the author's collection are two specimens seventeen inches long, which are the longest known, and one three and one eighth inches, which is the smallest. Cumberland County

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has been more prolific in these implements than any other. In the author's collection are three from this county. All that have been found in Kentucky come from along the Cumberland River or the territory adjacent thereto. Page 201 shows a number of specimens. The small, delicate implement with the large indentations upon either side of the blade was kindly loaned the author by Mr. Harry L. Johnson. The others belong to the author's cabinet.

PIERCED TABLETS.

These objects, made chiefly of green banded slate, pierced with tapering holes, have been found in all parts of Kentucky, but in largest numbers in the tier of counties bordering the Ohio River in the north-central portion of the State. While generally made of green striped slate from the region of the Great Lakes or from the glacial drift, yet specimens of granite, shale, cannel coal, jasper, limestone, steatite, and other materials are seen. The more common forms are thin oblong tablets, pierced with two tapering holes near the center in the line of the longer axis. These are generally termed gorgets, while those with a single hole near the end for suspension are called pendants. The distinction seems to be merely arbitrary, determined by the number and position of the holes. It has been suggested that many of those of gorget form were used in sizing cords of rawhide or sinew in the manufacture of bow-strings. Tablets thus pierced might be used successfully in giving a uniform thickness to these cords, but the material and excellent finish of the objects, together with the position of the holes and the fact that

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these holes seldom, if ever, show signs of wear, such as would necessarily be produced by friction in drawing a tightly fitting tendon or thong through in the effort to even the diameter, indicate that these handsome artifacts were not used for domestic purposes. Again, it has been suggested that they were shuttles used in weaving, but in view of the size, shape, and material this theory is hardly tenable, nor is it likely that they have ever seen service as twine-twisters. Some think them badges of authority, or ornaments which were strung together and worn around the neck, or that they were charms or talismans used as safeguards against danger and the malignant influence of evil spirits.

One of the most interesting specimens in the author's collection is of rectangular shape, made of very hard, compact red stone resembling jasper. It has been broken, the fracture extending through one of the perforations. The prehistoric owner has endeavored in a most ingenious manner to repair this prized object by boring two small holes diagonally through from one face to the edge of the fracture, designing to bind the two parts together with twine and at the same time prevent the binding cord from showing and marring the beauty of the side which would be exposed to view. Occasionally tablets are observed with more than the customary two holes, some having as many as four or five.

Those with one hole near the end are regarded as pendent ornaments, or charms. The perforation in many of these specimens in the author's collection shows signs of wear such as would be caused by friction with the cord if worn suspended about the neck or other part of the body. Both classes of pierced tablets are generally smoothly

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finished, though some are embellished with designs of conventional form. Occasionally rudely sketched figures of life are observed. The author has one of cannel coal upon which is crudely etched the image of a bear. Another displays a series of notches or indentations, certainly made by less skillful hands than those of the original maker of the object. Some of these figures were evidently designed as ornamental, others were certainly not so designed, and if not merely trivial, must have carried a significant meaning to the early Kentuckian who wore them. Page 202 shows twelve of these objects from Jefferson and Meade counties, and illustrates several of the forms common to this State.

TUBES.

Many stone objects of tubular form are seen. The uses of a large number of these are unknown, and little can be surmised from their form or general appearance. They range in size from small, delicate ones, scarcely an inch in length, to those of hour-glass pattern, measuring as much as twelve inches. The smaller ones were likely ornamental, and used as beads. The function of the larger ones is uncertain. Many writers have referred to the use of tubes of various kinds among the historic Indians. C. C. Jones says that the Florida and Virginia Indians used reeds in treating disease, by sucking or blowing through them, and also used them in cauterizing. Vagenas, in his "History of California," mentions the use of stone tubes by the medicine men for a similar purpose. The old Spanish writers tell of the use of forked wooden tubes,

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the tube being inserted in each nostril while the other end was held over burning herbs. Bancroft says that the Acazees of Mexico employed blowing through hollow tubes for the cure of disease. Some have suggested, with a great display of imagination, that many of the larger tubes, especially those of the hour-glass form, were for astronomical purposes. This is hardly likely, though they may have been used to protect the eye from the glare of the sun when viewing distant objects on a bright day, as one shades the eyes with the hand when looking toward the sun. Others have thought them musical instruments, or trumpets. General Thruston, in speaking of this form of tube, quotes from Judge Haywood's "Natural and Aboriginal History of Tennessee" as follows: "When the stone trumpet is blown through it makes a sound that may be heard, perhaps, two miles," and that "probably it was used for similar purposes to those for which the trumpets of the Israelites were used, namely, principally to convene assemblies and to regulate the movements of the army." The severest test of this class of tubes fails to evoke a trumpet-like sound, or any kind that might be heard more than a few rods, and negatives the idea that these objects were ever designed or used as wind instruments. However, the large tube pipe shown on page 276, when blown trumpet fashion, emits a sound of considerable volume. This is the only specimen we have seen which might, by the widest stretch of imagination, have served to "convene assemblies" or "regulate the movements of the army."

The smaller tubes are generally made of slate, and have holes of uniform size. The larger specimens of the hour-glass pattern are generally of steatite, though in the

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author's cabinet there is one of indurated clay. These usually have a narrow projection about the constricted part, the object widening from the middle toward the end in graceful curves, with a diameter at the end more than double that of the middle. They have bi-conical holes which were gouged out by a sharp instrument, not drilled. These holes conform to the outline of the object, being smallest at the middle. A feature of many of the short tubes with holes of even diameter is that one side is flattened or grooved. Many large beads of spherical form having this same feature are observed.

Page 211 shows three large hour-glass tubes. The upper one is of steatite, six inches long. It was found in Cumberland County. The middle one is of the same material, nine inches long, and was found in Crittenden County. The lower is of indurated clay and measures nine and one half inches in length and was found in a cave, together with other interesting remains, in Warren County.

The three flutes or fifes illustrated on page 217 are among the most extraordinary and remarkable products of prehistoric genius. The largest one is made of slate, with a serpent's head at the point where the mouth would be placed. The second is made of sandstone, the smallest one of bone. They measure respectively four and one half, three and one fourth, and three and one eighth inches in length. The largest one has five holes, the others four each. All give more or less correct musical sounds, and one at least emits nine of the twelve notes in the musical scale. The preparation of these instruments demonstrates that these people had some knowledge of music, and those who constructed them must have been moved by some

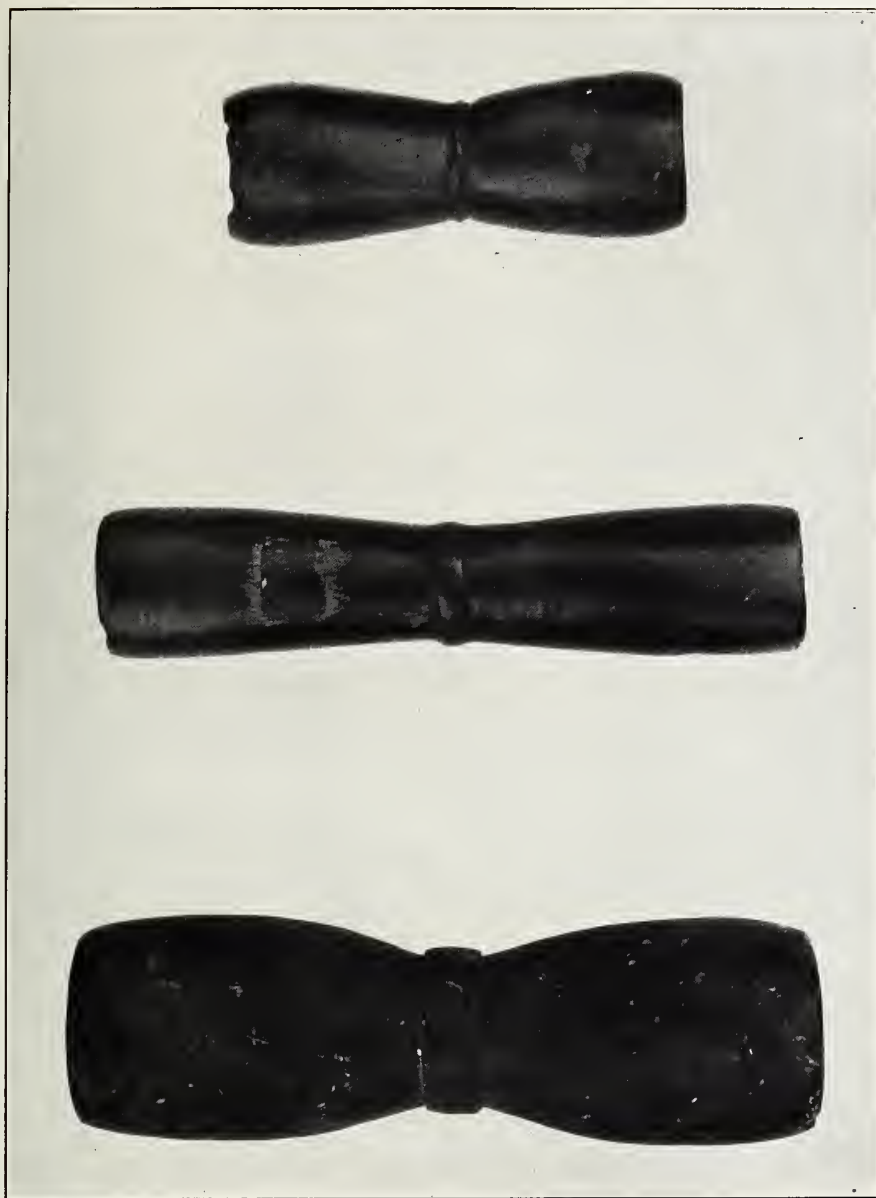
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definite idea of sound production from a cylinder, and the holes themselves, placed as they are at regular intervals, show that the purpose was to secure in the use of the instrument musical effect. Possibly they may have experimented and used cane cylinders pierced as these stone ones are, but the people who made these stone flutes abandoned the use of cane, if such existed, and from the slate and stone secured permanent instruments which would not be affected by changes of season or atmosphere.

The historic Indians had well-defined ideas of harmony and used these harmonies to excite grace and ease in their dances, and if these prehistoric people knew enough of music to construct stone instruments which would give three fourths of the notes in the musical scale, they must have had some sort of musical notions, which would enable them to sing, and by the use of such instruments provide their accompaniments, and to make use of such musical compositions as would produce pleasurable sounds for the ear and measures for the dance.

CRESCENTS.

The large crescents shown on page 212 are among the enigmas of the stone graves and mounds of Kentucky. The large specimen is made of syenite, and is beautifully finished. It resembles in form a pick, being fifteen inches in length, with a square cross-section of one and one half inches. It tapers to the points, which are chisel-like. All of these interesting implements are from the collection of Mr. Harry L. Johnson, and were found by him in the southern portion of the State. Many years ago a similar



TUBES, HOUR-GLASS.PATTERN

Upper, Steatite, length six inches; middle, Steatite, length nine inches;
lower, Indurated Clay, length nine and one half inches



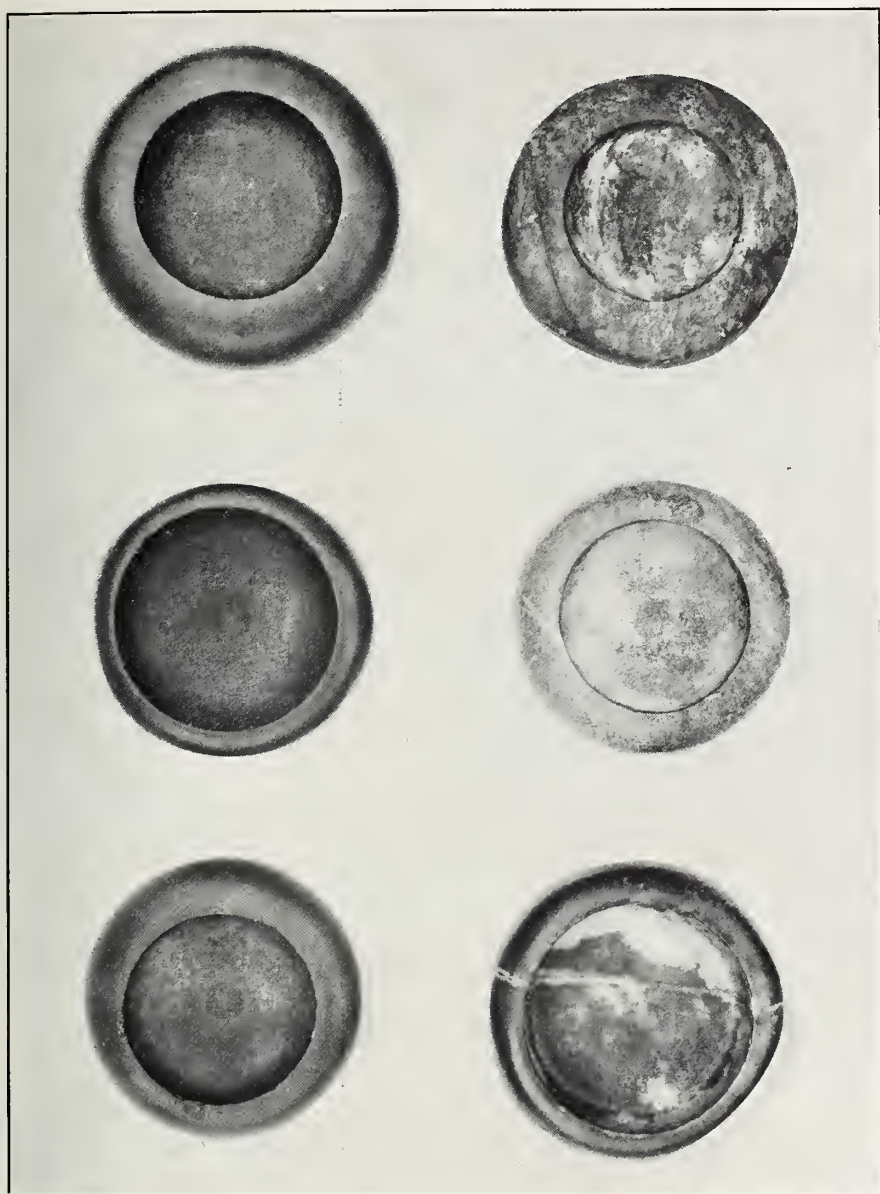
BOAT STONES

Length of longest, ten inches
Materials, Greenstone and Green Banded Slate



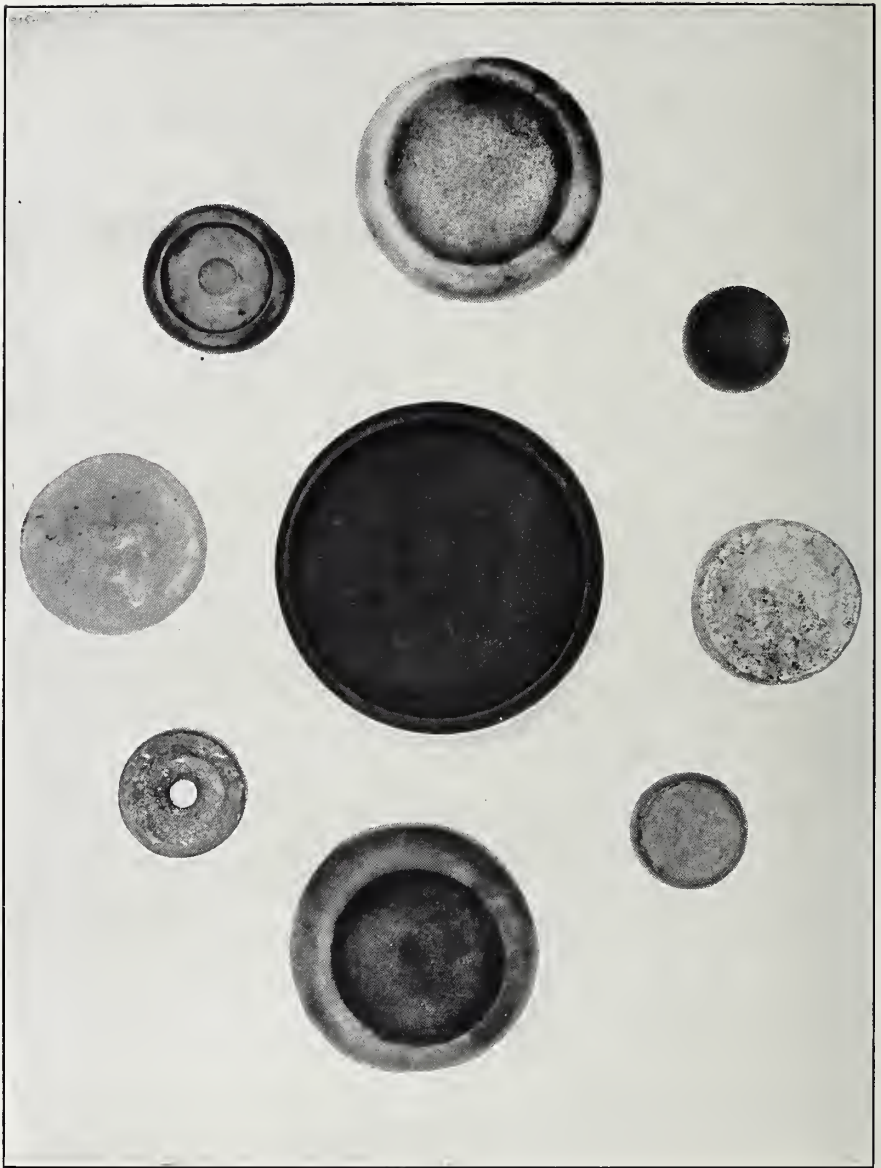
CRESCENTS

Length of longest, fifteen inches. Johnson Collection



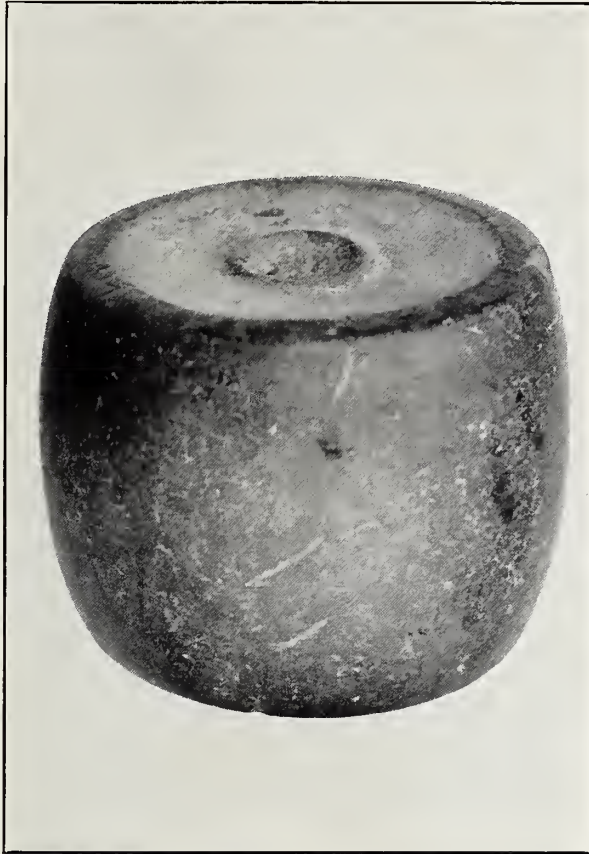
DISCOIDAL STONES

Material, Quartz and Quartzite. Diameter of specimen in left upper corner, six inches
From along Cumberland River



DISCOIDAL STONES

Large and small. Diameter of specimen in center, eight inches
From along Cumberland River



BARREL-SHAPED DISCOIDAL STONE

Material, Crystalline Limestone. Height, five and one half inches;
circumference, twenty-two and one fourth inches



CEREMONIAL AX

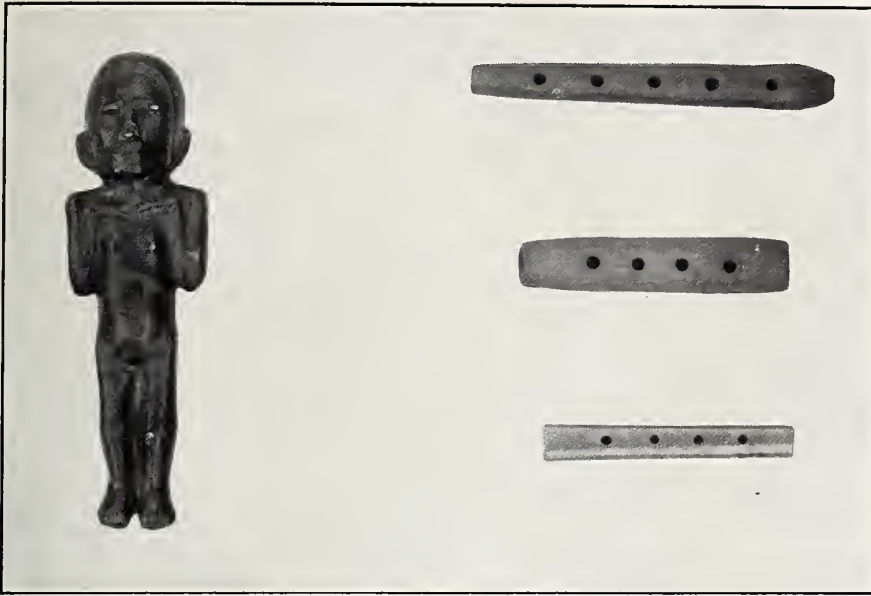
Length. ten inches. Material, hard reddish brown stone
From Northeastern Kentucky



HIGHLY POLISHED IMPLEMENTS OF DARK REDDISH STONE

Found in niche of rock, Bell County

One third size



HUMAN EFFIGY OF STEATITE
From Tennessee, near Kentucky Line

MUSICAL INSTRUMENTS
Slate, Stone, and Bone Flutes

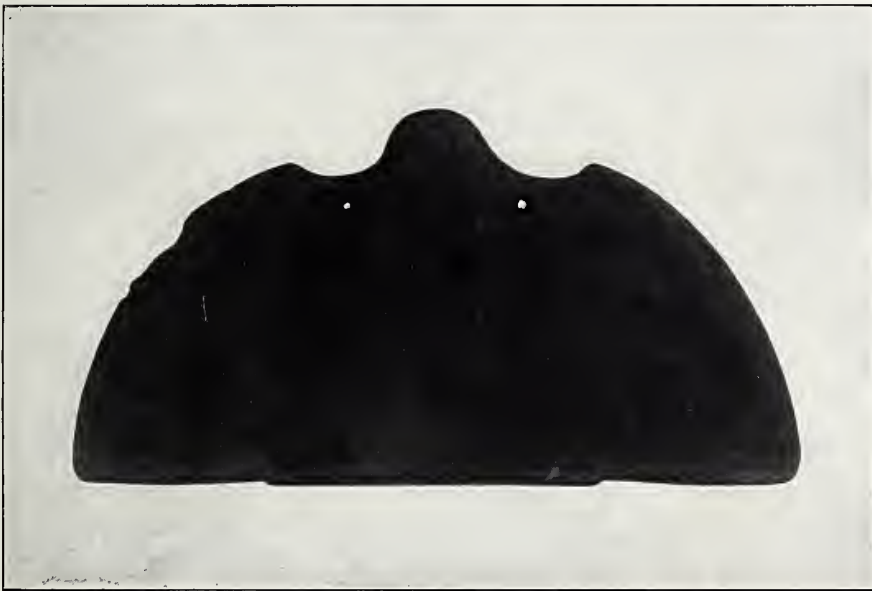


IMAGE OF FLYING BAT
Nine and one half by five inches. Material Slate, Trigg County
[217]



ORNAMENTS

Slate and Cannel Coal. From various parts of Kentucky

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specimen was secured from a cave near the mouth of the Ohio River by Professor N. S. Shaler, at that time connected with the Kentucky Geological Survey. This specimen, made also of syenite, measures thirteen inches in length, and is identical in form and finish with the one here shown. We can suggest no use for these remarkable forms. It has been stated that they were probably symbols of the sun, and used in the worship of that deity by the people who once lived in this State.

BOAT STONES.

Page 212 shows four boat-shaped objects of stone. These implements, resembling in form a canoe, the face of which is more or less hollowed out, are probably correctly classed among the ceremonials. They have each two perforations, near the end of the hollowed surface. The largest is of green slate, measuring ten inches in length. Upon the outer or convex side there is a keel-like projection extending from one hole to the other, and along this keel lies a hollow groove, apparently designed for the reception of a cord, which would be passed through the two holes. The sides of this projection, or keel, are ornamented with a checkerwork of incised lines. This remarkable relic was found many years ago in Crittenden County. Another is made of the same material, and is interesting on account of the dial-like figure on its sides. It has been suggested that the figure is a symbol of a sun-worshipping people. This specimen came from Warren County. The remaining two are made of green banded slate, and were found many years ago in Montgomery and Jefferson counties. The

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purpose for which these interesting forms were designed is totally unknown, and we have never heard a satisfactory use suggested. Stone objects of boat shape, but without the hollowed-out feature or the projecting keel, are found in many parts of the State. Some have a groove or constriction about the middle, apparently for the attachment of a cord. Some are notched at either end, as if to hold in place a cord passed lengthwise about the object. Others resemble the small hemispheres so frequently seen, but are provided with a groove about the rounded surface.

DISCOIDAL STONES.

About many of the remains of the Mound Builders there is not only a wide discussion but a wide divergence of opinion. There have been suggestions for a revision of the nomenclature of numerous objects prehistoric. Many of the names in use are local or accidental and sometimes meaningless, but they have been used so long that they have come to be understood as designating particular objects or things, and those who are interested in these matters readily understand what the names represent.

The term discoidal stone refers in a general way to disk-shaped objects of sizes running from one to ten inches in diameter. The wide territory in which these artifacts are found, and the large numbers which have been reclaimed either by plowing or from caves, graves, and mounds, indicate a very general use. Discoidal stones are made of a great variety of materials. Beginning with limestone, and running through sandstone, slate, marble, greenstone, granite, quartzite, and quartz, there seems to be no mate-

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rial from which a discoidal was not made. Upon them were expended not only great labor but a high degree of skill, and the finer types represent much ingenuity and an expenditure of patience that is amazing. These objects differ not only in size, but in the forms of their sides or faces. Some have convex faces and some concave, the latter occasionally coalescing and perforating the stone. In some specimens these cavities are very slight, oftentimes almost imperceptible; in others deep, and bringing the faces so near together in the center as to render the object translucent. This is especially true of those made from quartz.

In the classification of these stones there has been a great deal of uncertainty and disregard of all fixed rules. Many of the things called discoidals certainly did not serve the same purpose as the large and well-made objects which are typical of this class. If it be true that these stones were used in playing some game, then there must have been more than one sort of game played with them. The finer grades could not have been used, as is often suggested, in some sport similar to quoits, as they could not have stood the rough usage incident thereto.

The term discoidal, signifying a disk-shaped or circular object, has been applied to so many kinds of remains that it would be difficult for anybody to tell exactly what is meant thereby. Just where to draw the line between a discoidal stone and bead, spindle whorl, or the numerous pottery disks or counters, would tax the genius of any antiquarian; and in order to give any real meaning to the term it will be necessary for those who shall deal hereafter with these matters to contend for a more rigid classification.

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For a long time it was accepted almost without question and without objection that these stones had been employed by the prehistoric people in some game. In historic days disk-like stones were used in a game which was played upon level ground, something like our tennis courts. The stones were rolled upon the edge across the ground, which had been rendered smooth for this purpose. The parties entering the game had poles or staffs about eight feet long, and the purpose in the sport was to hurl these poles so as to strike the point at which the rolling stone would stop, each player being required to cast his pole at the same time as the others. (Dupratz' "History of Louisiana," page 366.) It has been suggested by others that these stones were rolled, and that a pointed pole was used by those engaged in the game, who ran after the stone and so adjusted the pole to the center that the disk might be removed from the earth and whirled on the staff. Others have suggested that they were used for pitching, as quoits, the purpose being to make the stone strike or rest closest to some peg or stake which had been driven into the ground. In the earlier discussion of these matters it was frequently suggested that they were used in mixing paints. It is hardly likely that they were ever so used, as it would have been an unnecessary waste of time and labor to have provided cavities upon both sides and to have expended upon a paint mortar the skill manifested in these remains.

Lieutenant Timberlake, who wrote in 1765, says that a discoidal stone is a round stone with one flat side and the other convex. Catlin, who wrote much later, says that the hurling stone was simply a round stone ring. In historic times the Indians who played games with these

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stones called it Chungkee, which interpreted, the early writers say, meant "running hard labor." Dupratz says that they were so fond of this game that they would place relatively larger stakes upon it than the modern poker player does on this card game, and that it had great fascination for the red man.

With all the ingenuity of the archeological mind, nobody has yet been able to suggest a theory concerning the use of these objects that would satisfy analytical investigation. These stones have been found in all kinds of places; out in open fields, in the graves, in mounds, and in caves, showing that their use was very general. They occur in large numbers along the Cumberland, Tennessee, Green, and Barren rivers, but are comparatively rare in Central and Eastern Kentucky. The best specimens come from the territory tributary to the Tennessee and Cumberland rivers. The writer's collection contains about fifty, of which one fifth are from Cumberland County, and these ten comprise the largest and most handsomely finished which have fallen under his observation. Whether it is the writer's good luck in dealing with Cumberland County people, or the great number of these stones that were made by the men who lived there in those remote days, he is not able exactly to determine.

After the various discussions we are compelled to conclude that these discoidals were used for a purpose which we, with all our ingenuity and reasoning, can not divine. The method of manufacture discredits the theory that they were ceremonials, charms, or talismans, and they show from the very way in which they were made that they were not ornamental. The amount of labor and care required in the manufacture determines the fact

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that they were not used as weapons. For want of a better theory we are compelled to settle down to the notion that they were used for some sort of game, of which we confess we are not able to say anything that can be received as reasonably correct. That they must have had some charm about them is assured by the fact that next to the pipe these people seem to have expended more labor on the discoidal stone than on any other thing they manufactured. The smoothness of the cavities, the care with which they were rubbed out, the beautifully rounded edges, and often a carefully formed secondary cavity within the larger, all show that the men who made these objects must have placed a very high value upon them and spared no pains to make them handsome and attractive. Few specimens of prehistoric art surpass or even equal in beauty of form, finish, and material the larger discoidals of blooded quartz from along the Cumberland and Tennessee rivers. A number of specimens from the author's collection are shown on pages 213, 214, and 215.

COPPER IMPLEMENTS AND ORNAMENTS.

A class of objects discovered in mounds and graves in Kentucky and other States which has given rise to much speculation are those of copper. This metal is found worked into numerous forms—axes, beads, chisels, cylinders, gorgets, disks, blades, spindles, spools, pendants, and wire. Articles made of copper have been found in all parts of Kentucky, but not in such quantities as in the States north of the Ohio River. Many copper beads have been found in Greenup County, in the northeastern

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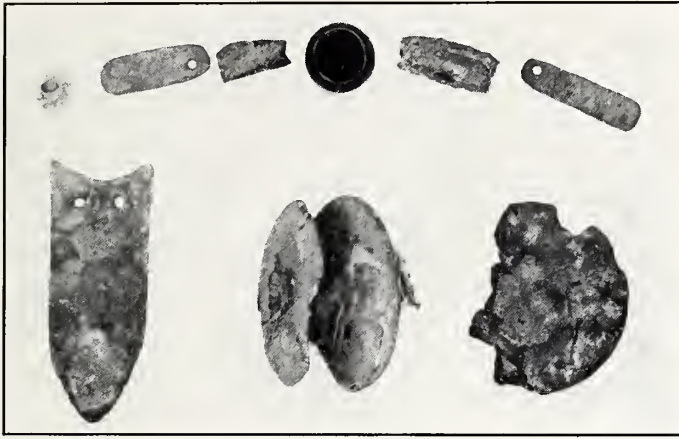
portion of the State; in Bell County in the southeastern, and in Fulton County in the extreme western portion. Most of the copper articles in Kentucky are in forms which were evidently used as ornaments. Knives are seldom seen, arrowheads are extremely rare, and one instance only of a grooved copper ax is known. Occasionally masses of copper are found beaten into the form of chisels or celts. All of these implements show a roughness and unevenness of finish, as if they had been hammered out from the metal in a cold state, with stone implements. Occasionally articles are found made of thin sheets of this metal, but these indicate that they are from hammered sheets, not rolled. No copper article which we have seen indicates contact with Europeans, unless it be several copper bells which were taken from a mound in Union County by Professor Sidney S. Lyon in 1870, and these were from an intrusive burial.

Perhaps no county has yielded such rich finds of copper as Montgomery. It has been the experience of those who have explored its mounds and other ancient remains that copper is almost invariably associated with the burials. Bracelets have been found there in large numbers, and these show by their form and finish that they were made by hammering out masses of the metal, the process of swedging in molds and casting being unknown to the aborigines of the State. Copper cylinders are frequently seen, ranging in length from one fourth of an inch to four inches, and in diameter from one fourth to one half an inch, which were probably used as beads. In fact, in some of these have been found the remains of the string or thong upon which they had been strung, perfectly preserved by contact with the metal.

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Among the most interesting classes of copper artifacts are those of spool or pulley shape. The form is that of two flattish cones united at the apices. They are made of thin copper, and in one instance a wooden spool plated with copper has been found. It has been generally supposed that these articles were worn in the ears as ornaments, and this supposition is very reasonable when we recall the ear ornaments of the figure upon the engraved shell gorget found at Eddyville in Lyon County. But certainly all of these spool-shaped articles were not used for the purpose of adornment. In the author's collection is a well-formed specimen two inches in diameter and one inch thick; about it is wound thread made probably from the fiber of wild hemp, still in an excellent state of preservation. (See page 227.) In a mound in Montgomery County, near Mt. Sterling, were found six massive copper bracelets or rings. These are now in the collection of Mr. Matt J. Holt, of Louisville, and are among the finest specimens of copper work that we have seen. From a mound not far distant were obtained several oblong articles of wood neatly plated with thin copper sheets, and a large copper pendant of crescent shape, together with a copper celt five inches long and two inches broad at its cutting edge.

Practically none of the copper—with the exception of a little from the western part of the State—indicates contact with the Europeans. Most of it shows traces of silver, which point to the copper mines of Lake Superior as its source. Everything found in copper shows that it was beaten into form and not molded or swedged. They probably early learned that the metal could be more easily worked when heated, but beyond this the metal worker of Kentucky did not progress.



COPPER BEADS AND SPOOL WITH HEMP THREAD



SMALL AXES

One half size. From Trigg County

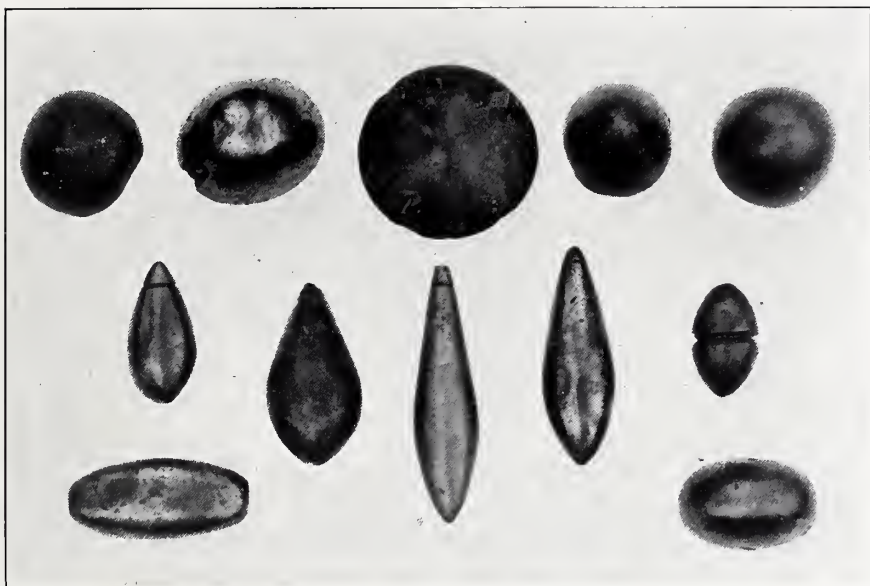


COPPER BRACELET

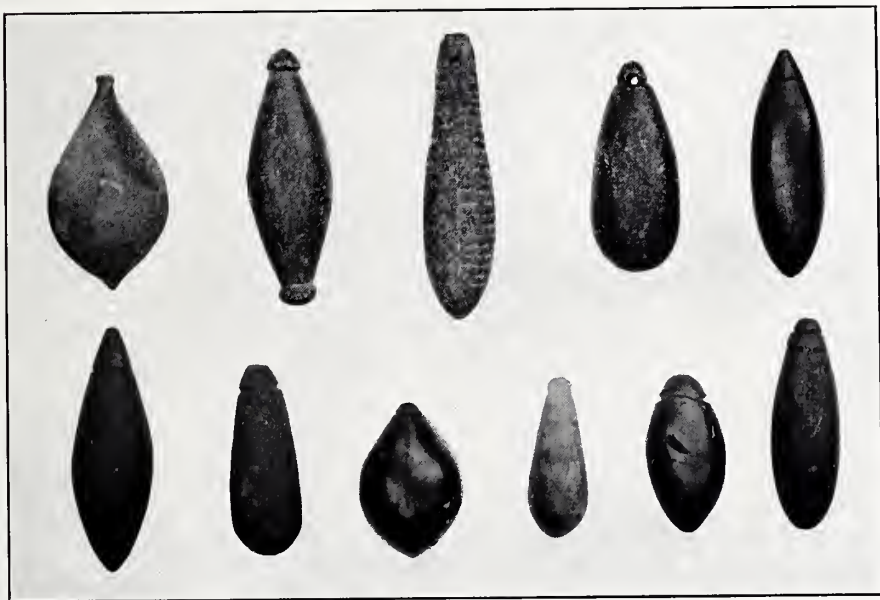
Circumference, eleven and one half inches
Six found in Mound in Montgomery County

COPPER AX

From Northeastern Kentucky



HEMATITE CONES, HEMISPHERES, AND PLUMMETS



HEMATITE AND GRANITE PENDANTS, SINKERS, AND PLUMMETS
Johnson Collection



Fluor Spar Beads, Engraved Shell Gorgets. Cross, of hard white material
 From Rogers' and Author's collections
 About one half natural size
 From Trigg County

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From the position of such copper as has been found in Kentucky it is absolutely certain that it was considered one of the most valuable of all their treasures. In opening the Moberly Mound, near Richmond, which evidently covered the grave of a great chieftain, was found three small copper beads strung around his neck, and the small number as well as the small size of the copper pieces which were laid away with the dead, would indicate that this metal was very rare and very highly prized.

It is difficult to understand why, in a few counties, there should be found such a large proportion of the copper that has been exhumed in Kentucky. So far as a cursory examination shows, fully half of all the copper found has come from Montgomery County or immediately on its borders, and why in this particular locality there should be, relatively speaking, such an abundance of copper, is difficult to explain. Following any line along which these prehistoric men traveled, Montgomery County could not have been a greater thoroughfare than Fayette, Clark, Madison, Bourbon, or Mason; and why, in so many mounds in Montgomery, and within a short distance of Mt. Sterling, there should have been such deposits of copper implements, as well as copper ornaments, is unknown. Mica, which was considered certainly of great value by these people, was widely distributed, being found in Eastern, Southern, Southeastern, and Western Kentucky, but outside of two or three counties—Montgomery in large degree, Madison in much smaller degree, and Bell in probably about equal degree with Madison, and some in Simpson—there have been no large discoveries of copper. More than seventy miles from the Ohio River, Montgomery County would not more likely be the subject of visits

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from the traders from Michigan than these other counties. As the copper must have come from the North, it is very extraordinary that it should have passed over seventy miles and then been deposited so extensively in Montgomery County, and so far as known there is no line of copper deposits connecting this county directly with the regions and the peoples north of the Ohio. There may be this one explanation, that there was some tribal relation or connection between the prehistoric men in Michigan and those who inhabited Montgomery County. All the appearance of this copper shows that it came from the northern peninsula of Michigan. Copper has been found in Indiana, Illinois, and in Ohio, and its scarcity in Kentucky indicates that the traders did not penetrate this region so often as the States north of the Ohio, or even Tennessee.

Matt J. Holt, Esq., a prominent lawyer of Louisville, was at one time with the United States Geological Survey, and made extensive investigations and exhumations in Montgomery County. He was enabled to gather a large number of splendid specimens, which have no counterpart in the State. Mr. Holt says that in every mound he opened in this county—and he investigated a large number of mounds—he found not a single one which did not contain some kind of copper article. Probably the handsomest copper ornaments that have been found in the State are six heavy copper rings, an illustration of one of which will be found on page 228. They are made of large copper bars, hammered with great skill and with stone implements, and the ends (so as to make the curve) were carefully and skillfully turned in, meeting with perfect accuracy. The exactness of this work would indicate

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that the bars had been bent over a stone or wooden anvil. The six are of uniform size and weight, and were taken from a burial at the base of a large mound situated close to Camargo, in the southeastern part of Montgomery County. They measure in circumference over the outer surfaces eleven and one half inches.

ORNAMENTS AND OTHER OBJECTS OF HEMATITE.

Objects of hematite occur in all parts of Kentucky, yet are sufficiently rare to cause them to be eagerly sought by collectors. It is probable that the mines of the Iron Mountain district of Missouri supplied the greater part of the ore used by the prehistoric men of this State. Hematite relics in the author's collection include axes, celts, chisels, knives, plummets, cones, hemispheres, beads, and gorgets. The red earthy variety of this ore is frequently found in irregular masses, having facets or smoothed surfaces which suggest their use as paint stones. Red ochre, or the disintegrated ore, was highly esteemed by the aborigine as paint for personal adornment or other uses. Stone cups and small earthen vessels filled with this material are frequently found near the bodies in mounds and stone-grave burials.

Grooved axes of hematite are exceedingly rare. In the author's collection of nearly fifteen hundred axes there is only one of hematite of sufficient size to have served as a hatchet or chopping implement. There are a few very small specimens, about one inch in length, from Northeastern Kentucky, but these, if not toys for the

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children, probably served as amulets or charms. Celts and chisels of this material are usually of small size, seldom measuring more than three inches in length by two inches in width at the cutting edge. Many measure only one inch, some even less. These smaller specimens were likely fitted into a handle of some kind and used as knives or scrapers.

Of all hematite relics, the plummet or pear-shaped objects are the most interesting and display the greatest skill of the ancient worker in this material. The finer are symmetrical in form, carefully worked, highly polished, and made of the harder and more beautiful varieties of the ore. The smaller end or neck has a notch or groove, apparently for the attachment of a cord or thread. Several specimens with holes through the neck have been observed. Some have thought that these were line sinkers, used in the capture of fish. Many of the cruder specimens were, doubtless, so used, but the great care shown in the manufacture of the finer ones indicates that they were not part of the fisherman's tackle, as the risk of loss while so employed would be too great to justify the labor required to produce these objects. Yet the Esquimaux, who excel in the manufacture of fishing apparatus, have been known to expend the greatest care in making sinkers of both ivory and stone, similar to the beautiful ones of hematite found here. Foster, in his "Prehistoric Races," inclines to the opinion that these articles were used in weaving to keep the thread taut, or to pass it through the warp, suggesting that the grooves or creases were too small to admit the attachment of thread except of delicate proportions. We believe many of the rougher specimens were used as sinkers in fishing, while the finer

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forms may have served as pendent ornaments or charms. While the greater number of plummets are made of hematite, many of other materials are seen. Specimens of granite are common, and occasionally those are found made of the interior whorl of some large shell, as the conch shell.

It is almost impossible to suggest a use for a number of small objects in the form of cones and hemispheres. They have been found in every part of the State. They are generally well formed, highly polished, and never show indications of rough usage. They have a base, oval or elliptical in outline, the objects sometimes being truncated or flat on top. They are often called paint stones, but, as many made of granite and other rocks are seen identical in form with those of hematite, it is hardly likely that they were used in the manufacture of paint. A number of hematite objects are illustrated on page 229.

ENGRAVED GORGETS AND OTHER OBJECTS OF SHELL.

Among the most artistic of all prehistoric finds are the ornamental forms of shell work. Shell was used by the aborigines for various purposes. Crushed into small particles, it served to temper the paste used in the manufacture of pottery ware. Of it were made domestic implements and utensils, as scrapers, knives, celts, drinking vessels, cups, and spoons. The ornamental forms of work in shell are seen in beads, pendent ornaments of various kinds, hairpins, earrings, carved masks, and gorgets.

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The engraved gorgets are the most beautiful of all work in shell, exhibit the highest degree of art, and are most suggestive to the antiquarian of the cultural and religious status of the people who formerly inhabited the State. The curious designs upon these objects have been a source of interest and wonder, and even the casual observer must feel that these strange markings had a very definite and well understood significance to the people of the Stone Age. Kentucky has not been so prolific in these gorgets, especially those with highly conventionalized figures, as Tennessee. Perhaps the whole number of specimens discovered would not exceed one hundred. Among the figures seen upon these shells are the human form and face, snakes, birds, spiders, the cross, and beautifully scalloped disks. A most remarkable specimen was found in a grave at Eddyville, in Lyon County. When the Branch Penitentiary was being constructed, on the east bank of the Cumberland River, it became necessary to open a quarry in order to secure stone for building purposes. While the earth was being cleared away there was found, on the bluff which overhung the river, an ancient burial ground, and a large number of graves were thus removed. The exhumation of these remains created considerable excitement, and in one of them was found the beautiful gorget shown on page 239. This has been most thoroughly described by Professor W. H. Holmes in the "Smithsonian Miscellaneous Collections," Volume 45, as follows:

"It is a symmetric saucer-shaped gorget five inches in diameter and made apparently from the expanded lip of a conch shell (*Busycum perversum*). It is unusually well preserved, both faces retaining something of the origi-

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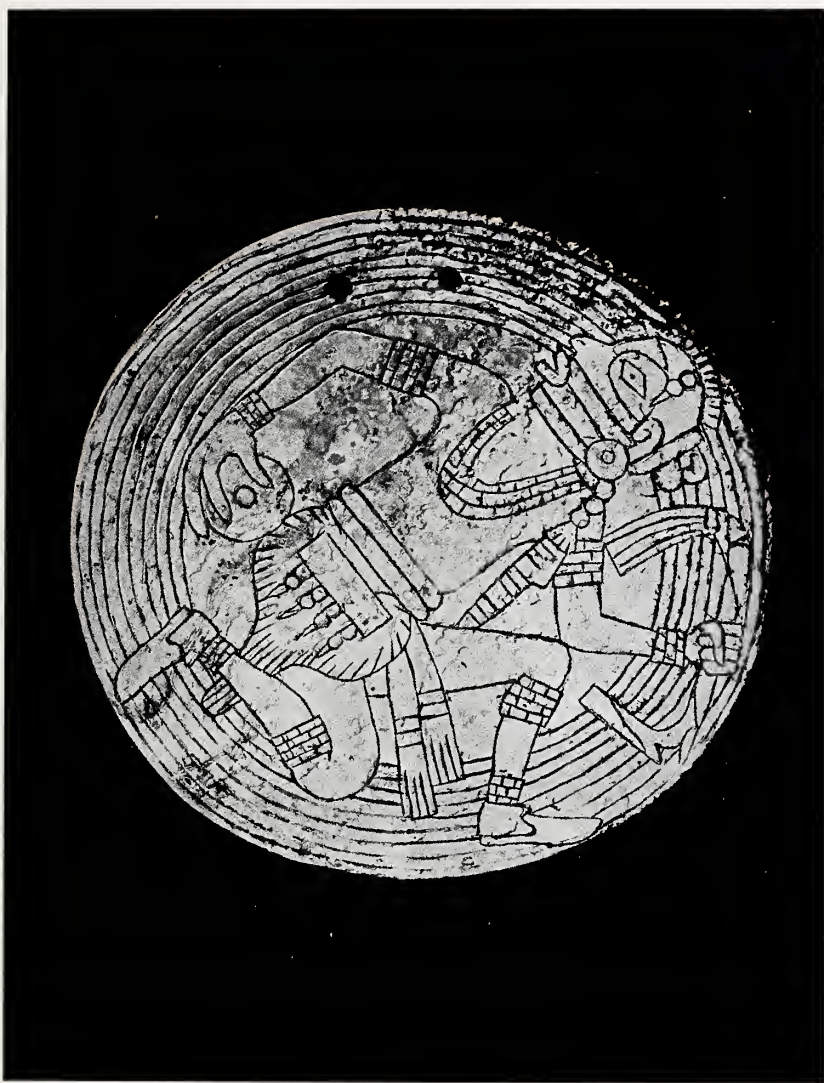
nal high polish of the ornament. Two perforations, placed near the margin, served as a means of suspension. The back or convex side is quite plain, while the face is occupied by the engraving of a human figure which extends entirely across the disk. It will be seen by reference to the illustration that this figure is practically identical in many respects with others already published. It is executed in firmly incised lines and is partially inclosed by a border of nine concentric lines. The position of the figure is that of a discus-thrower. The right hand holds a discoidal object, the arm being thrown back as if in the act of casting the disk. The left hand extends outward to the margin of the shell, and firmly grasps a wand-like object having plumes attached at the upper end, the lower end being peculiarly marked and bent inward across the border lines. The face is turned to the left; the right knee is bent and rests on the ground, while the left foot is set forward as it would be in the act of casting the disk. The features are boldly outlined; the eye is diamond shaped, as is usual in the delineations of this character in the mound region. A crest or crown representing the hair surmounts the head; the lower lobe of the ear contains a disk from which falls a long pendent ornament, and three lines representing paint or tattoo marks extend across the cheek from the ear to the mouth. A bead necklace hangs down over the chest, and the legs and arms have encircling ornaments. The lower part of the body is covered with an apron-like garment attached to the waist band, and over this hangs what appears to be a pouch with pendent ornaments. The moccasins are of the usual Indian type and are well delineated. A study of this figure strongly suggests the idea that it must represent a discus-thrower

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engaged, possibly, in playing the well-known game of chungkee." The illustration on page 239 was made from Plate xxix of Volume 45, "Smithsonian Miscellaneous Collections."

Another most beautiful piece of shell art (page 240) is one which the author secured from a gentleman residing in Lincoln County. It was found in a mound near Crab Orchard Springs more than thirty years ago, and was preserved in the family of Mr. A. C. Lunsford until about two years since, when he was kind enough to let the author have it. It represents a double-headed eagle with its claws drawn up under the body. The wings and tail feathers are gracefully designed. It is made from the extended lip of some large shell, probably the *Busycum perversum* or conch shell, which comes from the Gulf or South Atlantic Coast. This specimen has a hardness of its polished surface which is very unusual. It looks almost as if it were polished ivory. It is much harder and more perfectly preserved than the average shell gorget.

A third very handsome specimen of engraved gorgets was found in Trigg County (see page 241), and is of the conventional rattlesnake pattern. The design of the work is good, its execution careful and painstaking, and it is among the largest specimens that have fallen under the observation of the author. It is seven and one fourth inches in its greatest diameter. The smaller serpent gorget on the same page was found in Southeastern Kentucky. It measures five inches in diameter. While not so large or so distinctly marked as the other specimen, it represents a higher degree of skill on the part of the ancient artist. It has been said that these serpent gorgets were

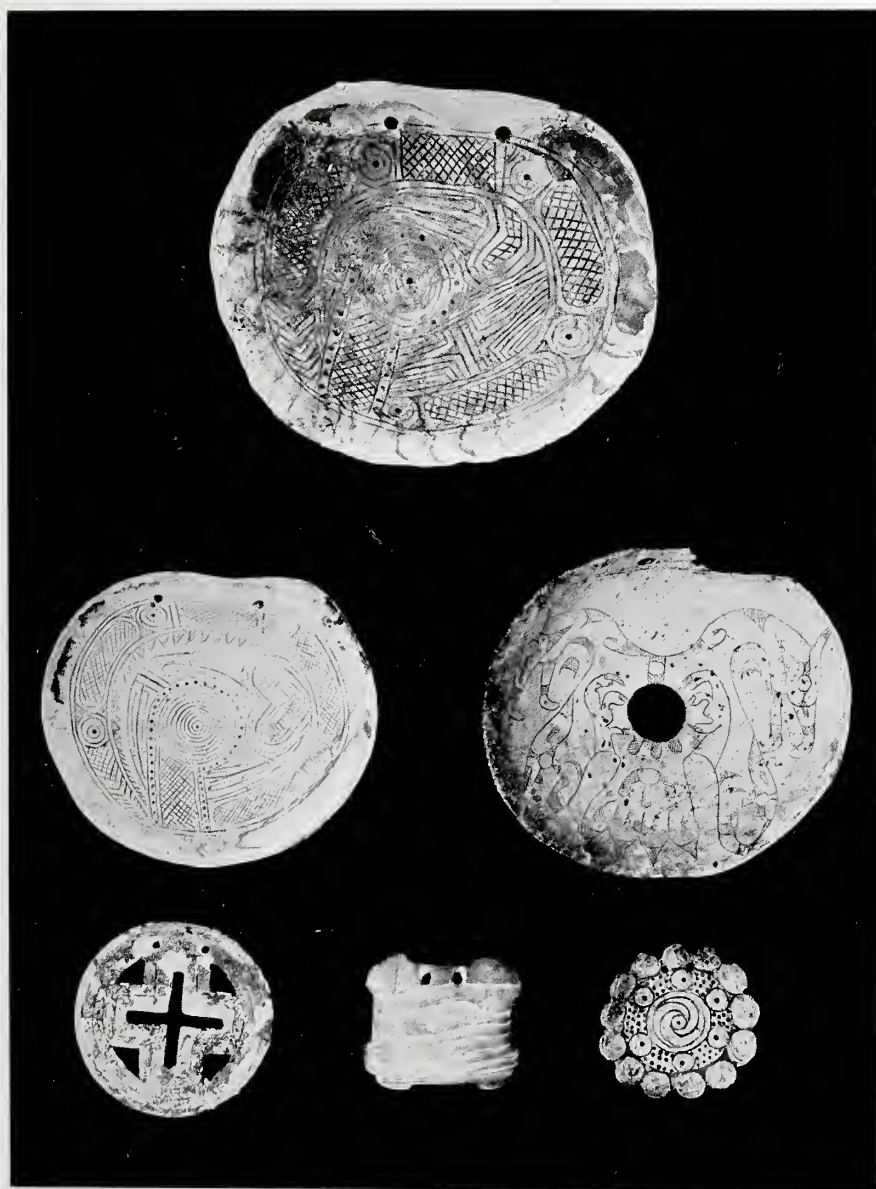


SHELL GORGET

Man Throwing Discoid. From Lyon County
After Holmes

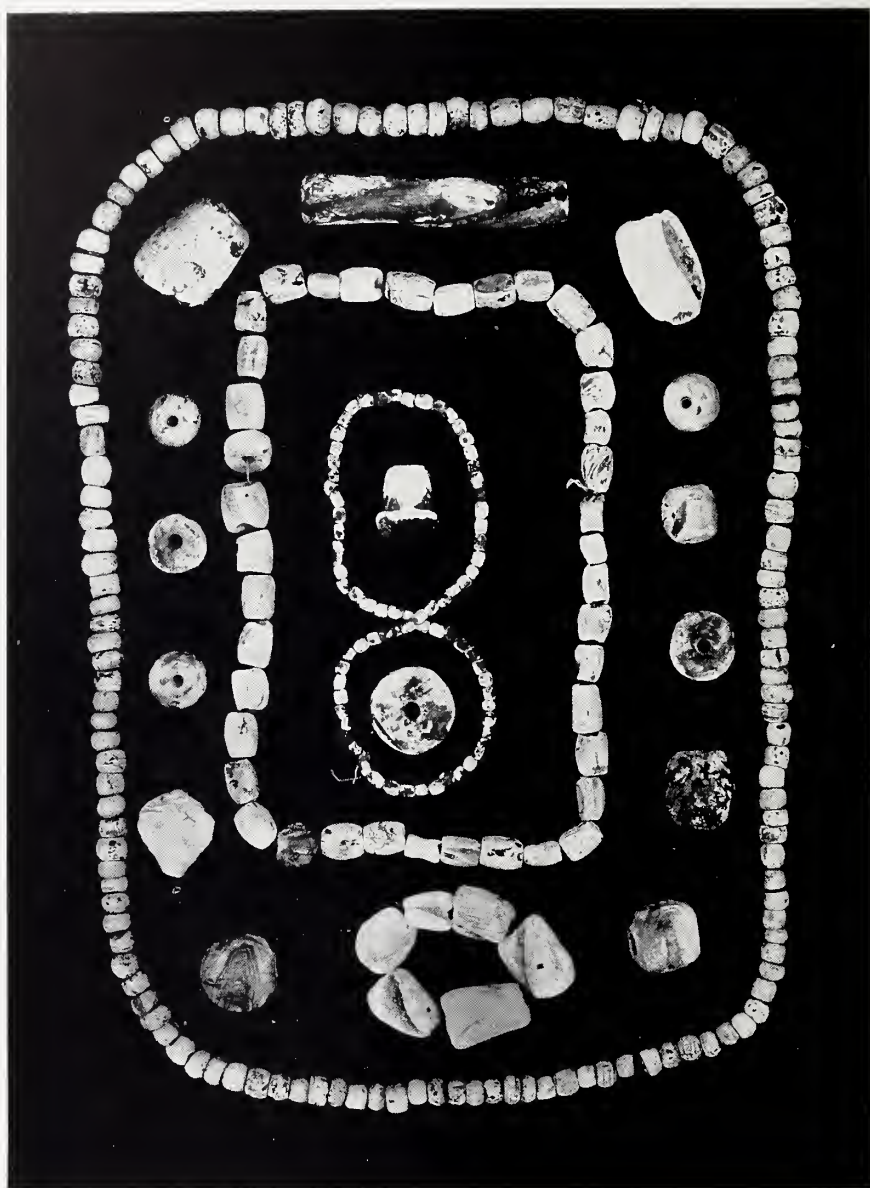


SHELL GORGET—DESIGN OF DOUBLE EAGLE
Diameter, six inches. From Lincoln County



ENGRAVED SHELL, GORGETS

Diameter of largest, seven and one half inches



SHELL BEADS
Johnson Collection

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probably worn on ceremonial occasions, where the serpent (always a rattlesnake) played an important rôle. Magee and Thomas ("Prehistoric North America," page 357) say that the conventionalized serpent appears to have been of local origin, and confined almost exclusively to Shawnee habitats in Tennessee and Northern Georgia, and Cherokee territory in Western North Carolina and Eastern Tennessee. The small gorget on the same page, showing the design of a cross, came from a mound in Christian County. The cross is of frequent occurrence in aboriginal remains in Tennessee and Kentucky, and these remains are of an age preceding the period of contact with the whites. Efforts to connect the cross of prehistoric America with the cross of the Old World have proved futile, and the theories attempting to account for its presence among the symbols of this continent are of little value, because based upon insufficient and most unsatisfactory data. Its occurrence here seems to be one of those coincidences which are occasionally found in the customs, ceremonies, and symbols of people of different origin and inhabiting different portions of the globe. Small crosses appear on the backs of the spider figures on page 230. These specimens were found in Trigg County upon the farm of Mrs. Ellen Rogers, who kindly sent them to the author for illustration. The scalloped disk (page 241) is a most interesting specimen, and was also found in Trigg County. Holmes inclined to the opinion that these forms might have been calendars, from the fact that similar disks are engraved on stone. A striking feature of these disks is that the outer zone usually, but not always, consists of thirteen circles. This is true of the specimen mentioned above, and of several others which the author has observed from the southern part of the State.

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Large numbers of beads of shell are found in the graves and mounds of Southern and Western Kentucky, and in smaller numbers in other parts of the State. Many are simply the smaller varieties of natural shells pierced for suspension. Others are made of the outer walls of the univalve, or from the bivalves common to all Kentucky streams. The finer and more beautiful beads are made of the columellæ of large univalves cut to the desired size, symmetrically formed, carefully polished, and pierced lengthwise for suspension. Flat button-shaped beads with a hole through the center are found in large numbers. Occasionally beads of entire pearls are seen. They were the richer and more gorgeous, and with the carved beads of shell constituted the most effective ornaments used by these people. Those who were not able to afford these more stylish and artistic forms resorted to the use of small and delicate shells, as the *marginella conoidalis*, making a hole for the string by grinding the outer end of the shell, thus wearing away enough of it to make an opening into the center. In burials the position of beads with the remains show that they were worn on strings about the arms and ankles, as well as around the neck. Shell bracelets and anklets are most frequently of the flat disk variety, or else composed of entire, but small, univalves. The rattling of these shells produced by the rhythmic movements of the limbs in the dance would produce sweet music to the ears of the dancers, and render this amusement the more attractive and enchanting. In the author's collection are many massive beads from the southern part of the State. They are made of the columellæ of univalves, very large and heavy, and lack the symmetry of outline and beauty of finish seen in the smaller discoidal

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and barrel-shaped specimens, being merely roughly dressed sections of the central whorl, which has been pierced longitudinally. They occasionally reach a length of two and even three inches. In spite of their ungainly forms, in the eyes of the collector they are among the most prized of all shell beads.

The mounds and graves of Southern Kentucky have yielded large numbers of what are supposed to be hairpins, made from the inner whorl of large univalves, but not nearly in so large quantities as Tennessee, which has been called the great storehouse of these as well as other ancient objects of shell. In the author's collection are several specimens made from the columellæ of the conch shell. The largest has a spherical head and a shaft five and one half inches long. It is very slender and symmetrical. Doubtless these forms were often used as hairpins, though an early writer refers to the use of such objects as ear ornaments.

Spoons made of the shell of the mussel are quite common. These mussel shells are found in large quantities in Kentucky streams, particularly in the Cumberland, Tennessee, Green, Barren, and Kentucky, and afforded an ever-present supply of material for the manufacture of spoons, beads, and various kinds of shell ornaments. The spoons are generally formed of that section of the shell which would make possible the carving of the handle for use by a right-handed man. But one specimen, found in Union County, shows that it was intended for a left-handed person. Occasionally celt-shaped implements are found. Madison County has yielded several.

Vessels and cups made of large univalves are sometimes found. A cave near Glasgow yielded two large

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specimens which had been fashioned into vessels. One was provided with a hole, evidently for suspension. In another cave in Barren County was found a scalloped disk gorget made of the same species of shell.

The shells of the fresh-water mussel were used by the historic Indians of the Mississippi Valley as tweezers for plucking out the hair. By reason of the close contact and the sharp surfaces of the two valves, they would be well adapted for this purpose, and it is reasonable to believe that they were used for similar purposes by the prehistoric men. Knives and scrapers were also made of these shells. A number of specimens showing use as scrapers have been found in Salts Cave.

From the large number of shells found in Tennessee and the southern part of Kentucky, which must have come from the Gulf or South Atlantic Coast, it is an assured fact that an extensive traffic in these articles was carried on among the people of these two sections. Almost the entire high-grade product in shell work is from material brought into Kentucky from other regions. Perhaps many of these articles, especially those of ornamental form, were fashioned before their introduction here. It can be readily understood that the people of Kentucky, who had such an abundance of corn, nuts, and maple sugar, would be ready to exchange these articles for the beautifully wrought pins, gorgets, and beads made into such exquisite shapes by the men along the Gulf and Atlantic coasts; and the coming of the shell trader must have always been to the original inhabitants of Kentucky a pleasing and delightful experience, and wherever carried, these articles would find a ready sale and glad welcome in the homes of the inland men and women. It is easy

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to recall the period when the peddler with his pack was ever welcomed as a guest in the home of the countryman removed from proximity to stores, and it is reasonably certain that the shell man, among the older and younger women of the prehistoric period, would be gladly received and courteously entertained.

STONE BEADS AND RINGS.

There are many things in connection with the prehistoric people of Kentucky to show that they were fond of ornamentation, and whether this was in pendants, gorgets, earrings, beads, hairpins or rings, all indicate by the abundance of specimens found that adornment of the person was no inconsiderable element in prehistoric society.

In the vast number of finds over the various parts of the State, beads are second only to arrowheads. Hundreds of thousands of these have been collected and distributed, and it has been no unusual thing to find great strings of beads of various kinds buried with the dead. These beads were made from stone, shell, bones, clay, and sometimes from seeds or nuts. They are flat, round, small, large, short, long, and judging from the conditions which existed in regard to them it is reasonably certain that every woman, old or young, recognized beads as an important adjunct to her wardrobe; and the weight and size of many would indicate that, as in the historic Indian, these prehistoric men were accustomed to decorate themselves with beads of various kinds and hues.

As beads are very abundant, rings are very scarce. They are made of sandstone, cannel coal, and slate. Some

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have been made perfectly round, others flat on the top, something of the shape of our seal rings. Their size indicates that the hands of the prehistoric people were not larger than those of the present inhabitants of Kentucky. Three specimens of finger rings are shown on page 253. The larger ones on the page were probably used as ear pendants.

To show the great variety of materials used in the manufacture of beads, one frame in the author's collection, illustrated on page 251, contains beads made from banded slate, quartz, quartzite, Kentucky lithographic stone, cannel coal, greenstone, hematite, catlinite, indurated clay, granite, syenite, crystallized limestone, sandstone, and baked clay, with several others the material of which is unknown to the author. These range in size from less than half an inch in diameter to one and one half inches. The larger ones are frequently termed spindle whorls, and it is probable that many were so used, the rod or spindle being passed through the hole in the bead or whorl, thus enabling the spinner, by twirling with the fingers, to attain a rapid and constant motion. The numerous textile fabrics woven of spun thread which have been discovered in Salts Cave indicate that in that section certainly spinning was carried on to a considerable extent.

The most beautiful of the beads of the prehistoric man of Kentucky were those made of spar, some of which are as clear as crystal, others tinted with purple, others so richly colored as to resemble the amethyst. Several of these fluorspar beads are shown on page 230. The most interesting of these beads is of cushion shape, having ten flattened surfaces or facets. Through this diagonally has been drilled a hole of uniform diameter throughout. The large

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flat oval bead upon the same page is made of fluorspar, beautifully tinged with purple coloring. In making the hole through this object the aboriginal lapidary had drilled from either end, the perforations not meeting with exactness in the middle. Upon the same page is shown a handsome barrel-shaped bead of the same material, also a disk-shaped one of rock crystal.

Many of these beads are made from the very hardest material, as quartz and rock crystal, which are removed but a few degrees in hardness from the diamond. The great amount of labor and the endless patience necessary to have wrought these ornaments with the crude implements of the aboriginal stone-worker are sure indications of their great value in the eyes of the prehistoric man. The beautiful coloring in many indicates beyond peradventure that they were designed as ornaments, and were selected because of their rare and variegated markings.

These objects range in size from those we have described, up through larger ones, reaching finally the large perforated discoidal stones measuring four and six inches, which are identical in form, finish, and material with many of the beautiful specimens scarcely half an inch in diameter.

Many stone beads are of tubular form. The author's cabinet contains a beautiful specimen, which is mentioned elsewhere, made of a hard, compact red material resembling jasper. It has a square cross-section, and measures less than three eighths of an inch in diameter and four inches in length. Generally, elongated beads are an inch or an inch and a quarter in length. However, many measure two and even three inches and occasionally small tubes, evidently designed for use as beads, attain a length of four inches. A peculiar feature in many of the large

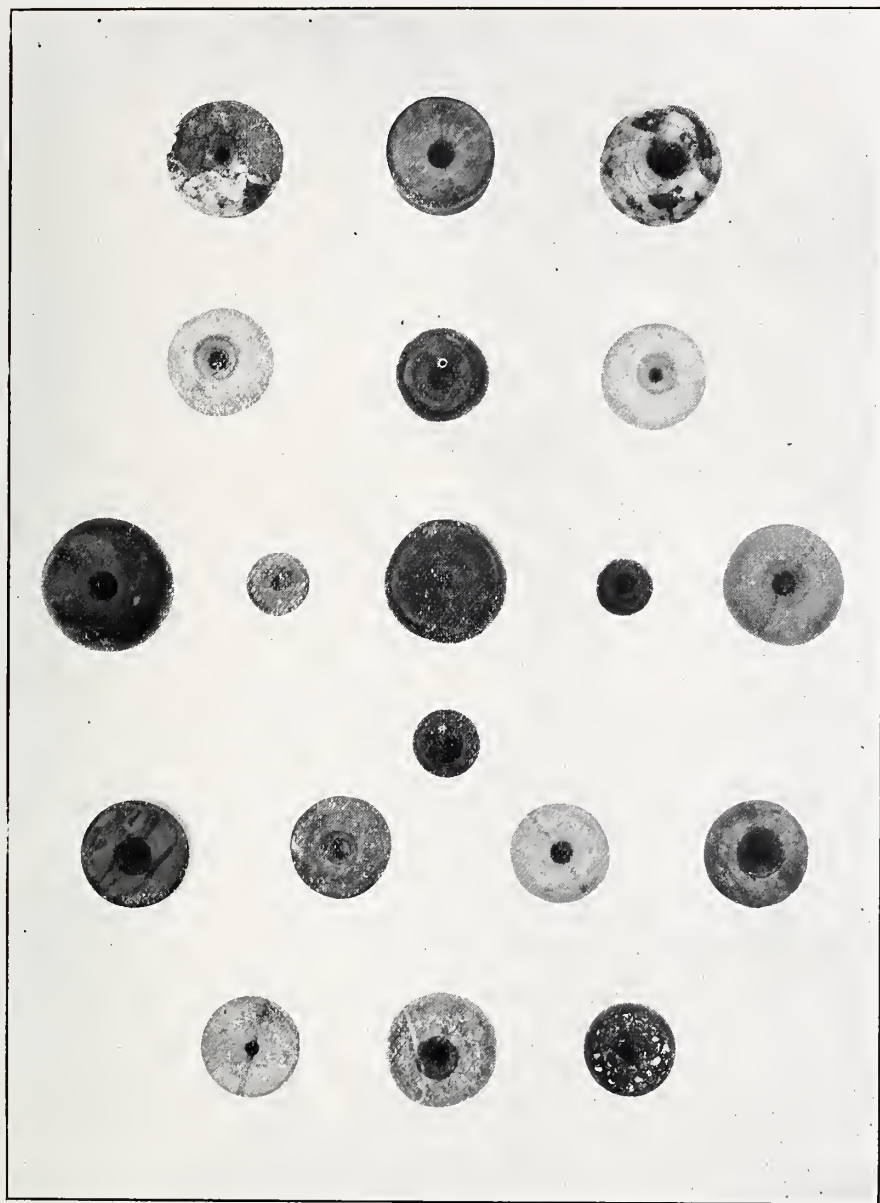
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spherical beads, made generally of the green banded slate, is that one side is flattened, or else provided with a groove such as is seen in many of the shorter stone tubes made of the same material, yet which were too large and heavy for use in personal adornment.

A graveyard on the Rogers farm, in Trigg County, at the point where Little River unites with the Cumberland, seems to be the greatest depository of aboriginal work. The beads from this point display a greater variety of material and more beautiful and varied forms than any other spot known in Kentucky. Though probably less than two thousand people were buried in this prehistoric cemetery, yet from this single spot many hundreds of beautiful specimens have been scattered throughout Kentucky and other States. In these graves were found not only these vast numbers of beads, but hundreds of other objects which had been prepared with equal skill and genius. The tomahawks, rings, gorgets, drills, spearheads, and pipes found at this particular place all evince extraordinary skill in those who manufactured the articles. From these graves, in so far as Kentucky is concerned, it is certain that the people who lived in the immediate vicinity of this burying ground had reached the high-water mark of stone art.

FISHING AND FISHING IMPLEMENTS.

The streams of Kentucky once abounded in fish. This was particularly true of the Ohio River at its Falls near Louisville, and if the vast number of fishhooks and stone sinkers which have been found in that vicinity constitute an index of the presence of fish, then this spot was more



SMALL DISCOIDS AND STONE BEADS

Slightly less than one half size

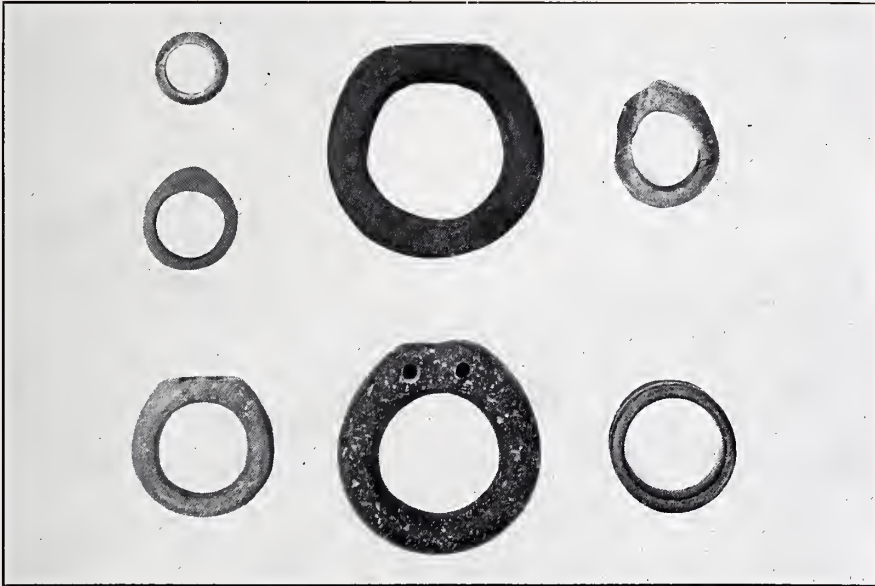
From Trigg County

Ornamentation.



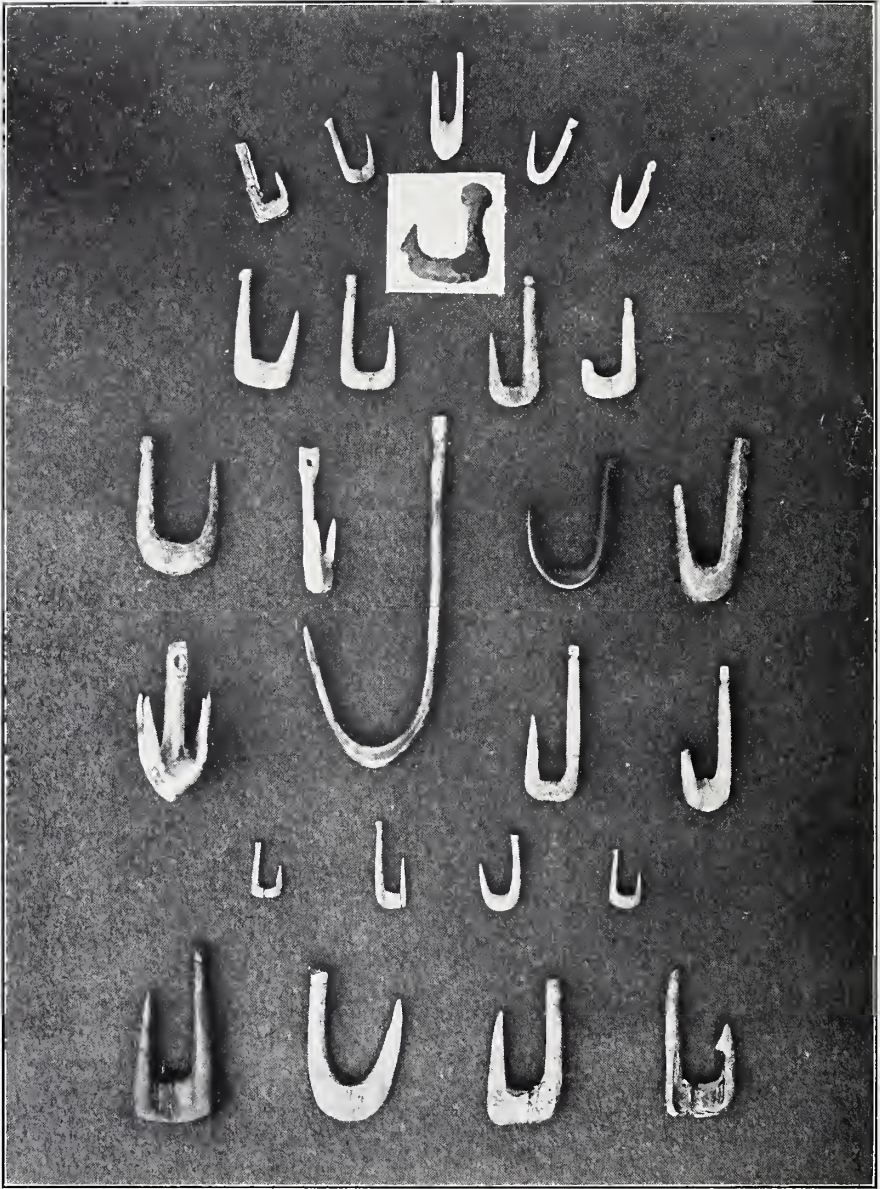
NECKLACES

Made of Shell Beads, Bird Bone Beads, Pebble Beads, Fossil Beads,
 Cannel Coal Beads, and Sandstone Beads
 From various parts of Kentucky



FINGER RINGS AND EAR ORNAMENTS

Materials Sandstone, Slate, Steatite, and Clay. Lower three, Johnson Collection.



BONE FISHHOOKS

Found about the Ohio River Falls at Louisville. The hook in white square is flint, found near Tennessee River

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abundantly supplied than any other portion of the stream, and was a favorite resort of the aboriginal angler. Bone fishhooks occur in great numbers upon the Indiana shore opposite Louisville, and in lesser number upon the Kentucky side. They are generally of the conventional fishhook form, but with the absence of a barb. Some are small and delicate, others large and heavy, the shank of the latter often measuring three and a half and even four inches, and the instrument being of such size that the base shows the curve of the marrow cavity of the large bones of which they were fashioned, and of sufficient strength to safely land fish weighing ten to twenty pounds. The shank or stem of these hooks is usually notched near the end for better attachment of the line, though in many specimens this feature is lacking, the stem being straight and smooth, leaving it difficult to understand how the primitive fisherman securely fastened his line. Occasionally specimens are seen in which the end of the shank expands into a rounded knob or is provided with an eyelet, but these are extremely rare, not more than two of each kind having reached the attention of the writer. Barbed hooks are equally rare; only two barbed specimens, so far as we know, have been found in this section. One is in the author's collection and the other belongs to Mr. Charles Patz, of Jeffersonville, Indiana. The prehistoric fisherman, lacking this most helpful feature in his hook, could not know the real pleasure of the modern angler, who delights in playing and worrying his game until, wearied with the unequal struggle and vain efforts to rid itself of the cruel barb, it finally succumbs and is drawn within reach of the dip-net or gaff. The aborigine had to rely upon strong tackle and a quick, steady pull; a weakness in either hook

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or line, or failure to draw promptly and keep the line always taut, meant inevitably the escape of his nimble game. Most of the hooks from the Ohio Falls have a rounded base, though in some it shows a straight line. A most interesting bone hook was found some years ago in Trigg County, upon the banks of the Cumberland River. The shank is pierced for the attachment of a line, and the specimen is provided with four prongs. This hook is carefully wrought, and reminds one of similar forms used by the modern Esquimaux. A number of bone hooks from Kentucky, and the Indiana shore of the Ohio River opposite Louisville, are illustrated on page 254. Several of these were kindly furnished the writer by Mr. Patz.

The simplest form of fishing implement used by the prehistoric men of Kentucky was a straight, double-pointed bait-holder or gorge. Very few well-authenticated specimens of this kind, so far as we know, have been discovered. Several bone objects ranging in length from one to two inches have been found in Christian County along the Little River. These are highly polished and sharpened at both ends, although there is no grooving about the middle, such as one would expect to find in a bait-holder. A mound in Montgomery County yielded forty well-made bone implements measuring from two to three inches and sharpened at both ends, but there is no indication that these were used in the taking of fish, although they might well have served the purpose of gorges. In the author's collection are several double-pointed flints of such a form as to suggest that they might have served as bait-holders. It is probable that wood was used in the manufacture of the straight bait-holder as well as in hooks of conventional pattern. A hook made of tough wood would be just as

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efficient as one made of bone, or as Captain Smith's "splinter of bone tied to the cleff of a little sticke." Hooks of copper and shell are unknown in Kentucky.

The harpoon and arrow were largely used by aboriginal man in the capture of fish, and in the evolution of the art of fishing it is likely that this method preceded the use of a hook or even the straight bait-holder. Among the immense number of arrowheads found everywhere throughout the State, many likely served as points for arrows or spears used in the capture of fish. In every large collection will be found numbers which would admirably answer this purpose. Harpoon heads, with one or more unilateral barbs, are occasionally seen. These were made from a long bone of some large animal. The lower part is usually flattened, thin, and pierced. Major G. B. Cockrell, of Cumberland Gap, Tennessee, has an interesting specimen of this class. In the collection of Mr. H. L. Johnson, of Clarksville, Tennessee, is a harpoon head of bone of unusual form. It is about seven inches in length and one and a half inches broad at the base, from which it tapers gradually to the point; one inch from the point is a very pronounced barb. An inch and a half from the base is a circular hole evidently designed for connecting, by means of a cord, the dart, which was a detachable one, to the shaft. This specimen is similar to one from Ohio described by Mr. Charles Rau in "Prehistoric Fishing in Europe and North America," page 146.

So far as we are aware, no remains of fishing nets have been discovered in the State, nor are there conditions favorable to their preservation, but it is reasonably certain that the prehistoric men used this method of taking fish. Mr. Gratz, the former owner of Mammoth Cave, in a letter

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to Doctor Samuel L. Mitchell, of New York, written many years ago (*Archeologia Americana*, Volume 1, page 323), says: "There will be found in this bundle two moccasins in the same state they were when taken out of the Mammoth Cave, about two hundred yards from its mouth. Upon examination it will be perceived that they are fabricated out of different materials. One is supposed to be made of a specimen of flag or lily which grows in the southern part of Kentucky; the other of the bark of some tree, probably the papaw. There was also in this package a part of what is supposed to be a Kinniconeche pouch, two meshes of a fishing net, and a piece of what we suppose to be the raw material out of which the fishing net, the pouch, and one of the moccasins were made." This is the only mention of an aboriginal fishing net we have seen, and it is likely that this fabric was not so used, but was part of the articles found in connection with a mummy which is said to have been discovered in Mammoth Cave in 1813, but which in reality came from Short Cave, several miles distant. In the author's collection is a little hand-bag from Salts Cave, resembling the old-fashioned reticule; the larger part of it is an open fabric, and were the article not complete a fragment of the open work might readily be taken for a fishing net.

Sinkers, or stones used as sinkers, have been found in large numbers along all the Kentucky streams. They range in weight from less than an ounce to five pounds. Usually they are roughly made and notched or grooved to hold the line. Some are handsomely finished and of rare material; almost every variety of stone was utilized, and specimens resembling in form the stone sinkers, but made of baked clay, are occasionally seen.

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In the streams of Kentucky, along which these people found their favorite domiciles, fish would be an ever-present means of support and food. Their system of cooking would render its use adapted to the preparation of fish food. Boiling in their kettles, baking in their ovens, or baking in shucks or on boards, or wrapped in ashes, would secure the preparation of this food without great labor, and afford always ready means for the preparation of an attractive and delightful meal. And it is as certain as any statement can be about people concerning whom there is no written history, that the prehistoric men who lived in Kentucky regarded and used fish as one of the most constant and appetizing of their viands.

DRILLS, DRILLING, AND FIRE MAKING.

Numerous artifacts of stone, especially those of ornamental or ceremonial form, show a wonderful mastery of the art of drilling by the prehistoric lapidary. Much of his work was done upon such material as granite and quartz, and we can not but marvel at his ingenuity and skill in making, with the crude materials at hand, instruments which would pierce these rocks as nicely and as accurately as the most improved diamond drill of his modern brother. Mr. Kunz, the gem expert with Tiffany & Company, in his work, "Gems and Precious Stones," page 304, says: "Many of the aboriginal stone objects found in North America and elsewhere are marvels of lapidarian skill in chipping, drilling, grinding, and polishing. . . . No lapidary could drill a hard stone object truer than some of the banner stones, tubes, and other objects made of quartz, greenstone, and granite that have been found in

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North Carolina, Georgia, and Tennessee." The stone work in the States named by Mr. Kunz does not in any particular excel in beauty of form or finish the work of the prehistoric Kentuckians. In the author's cabinet is a beautiful tube of a hard, compact red material, four inches in length by three eighths of an inch in thickness. Through this, with remarkable precision, the ancient stone-worker had bored a hole one eighth of an inch in diameter. Many beads measuring two and three inches in length, made of the interior whorl of some large shell, have holes so small that we wonder how they could have been made without metal instruments. Beads and tubes of rock crystal, quartz, and granite show the same mastery of this art.

Many implements of flint are classed by archeologists as rimmers or drills, yet comparatively few of these would have been serviceable as such. Only those with a bore of rhomboidal or triangular section are at all adapted to the work of drilling, and many of these seem too thin and fragile for us to believe that they were ever designed for use upon the harder stones. Objects of this class might have served satisfactorily in working slate and the other soft stones used in the manufacture of gorgets and pendants. Many implements, by the irregular base and finished bore, show unmistakably that they were intended as drills or perforators, and that they were operated simply by being pressed against the material to be pierced and rapidly turned back and forth until the hole was made. The most effective drill used by the Kentucky aborigine consisted of a hollow cane, or a cylinder of copper, or even a straight rod of wood. These, used with sand as the abrasive or cutting material, and water, served to pierce the hardest materials. This work might have been done by

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merely twirling the drill between the palms of the hands or by holding the object to be pierced, if it were a small one, in one hand, pressing against it the point of the drill with the shaft resting upon the thigh, and imparting a whirling motion by rolling the shaft back and forth with the other hand. As the rapidity with which a drill cuts depends largely upon the velocity of the revolutions, it became desirable for the prehistoric man to devise other methods than by simply twirling the reed or rod, to which was attached the cylinder of copper, with the hand. Naturally, as he became more experienced in the work he evolved other methods—perhaps discovered, as has the Esquimaux, that the strap drill is an excellent device for attaining rapidity of revolution. In this form of drill the shaft is held in position by a piece of wood containing a socket into which the end of the shaft fits, the wood being held in the mouth, the object to be pierced laid upon the knee, and by bending the head the point of the drill may be firmly pressed against the object. Then a thong is wrapped several times around the shaft, one end being held in either hand; by rapidly drawing this back and forth a rapid whirling motion is imparted to the shaft, and by downward movement of the head the requisite pressure is obtained upon the point.

It may be that the prehistoric man of Kentucky finally evolved the bow drill, another form which was common among the historic Indians. Perhaps he even learned to use the pump drill, which was known to the Iroquois when they first came in contact with the whites. At any rate, whatever may have been the instruments or the methods employed, he secured results of which the skilled lapidary of to-day would not need to be ashamed.

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Closely connected with the art of drilling was the art of fire making. Two methods of producing this agency, so necessary to man's welfare and comfort, and so extensively used by the prehistoric people in ceremonies connected with the burial of their dead and perhaps in religious rites as well, were in use among the Indians when first known to the Europeans. One was by means of flint and pyrites, flint and steel being a European introduction. The other was by friction of wood on wood, the ground-off particles becoming ignited with the heat thus produced. This latter method was known to practically all modern tribes, and was their main reliance for fire making. The methods and instruments employed resemble closely those used in drilling. A shaft of wood was caused to revolve rapidly in a socket in a wooden block. The heat thus generated caused combustible materials placed in and about the socket to become ignited. The methods of causing the shaft of the fire-making apparatus to revolve were the same as those used with the shaft of the drill.

IMAGES AND IDOLS.

The carving in stone of the human form and features by the prehistoric man of Kentucky as a rule was crude. His best work in face-making was developed in the manufacture of pottery, or upon the stone used in the manufacture of pipes. Stone images are of infrequent occurrence, while images in clay, produced in pipes and upon their domestic implements, are very common. Not many more than half a dozen stone images representing the human form have been found in Kentucky, so far as is now known.



THREE STONE IMAGES FROM KENTUCKY

Made from plate in Doctor Thomas Wilson's "Prehistoric Stone Art"



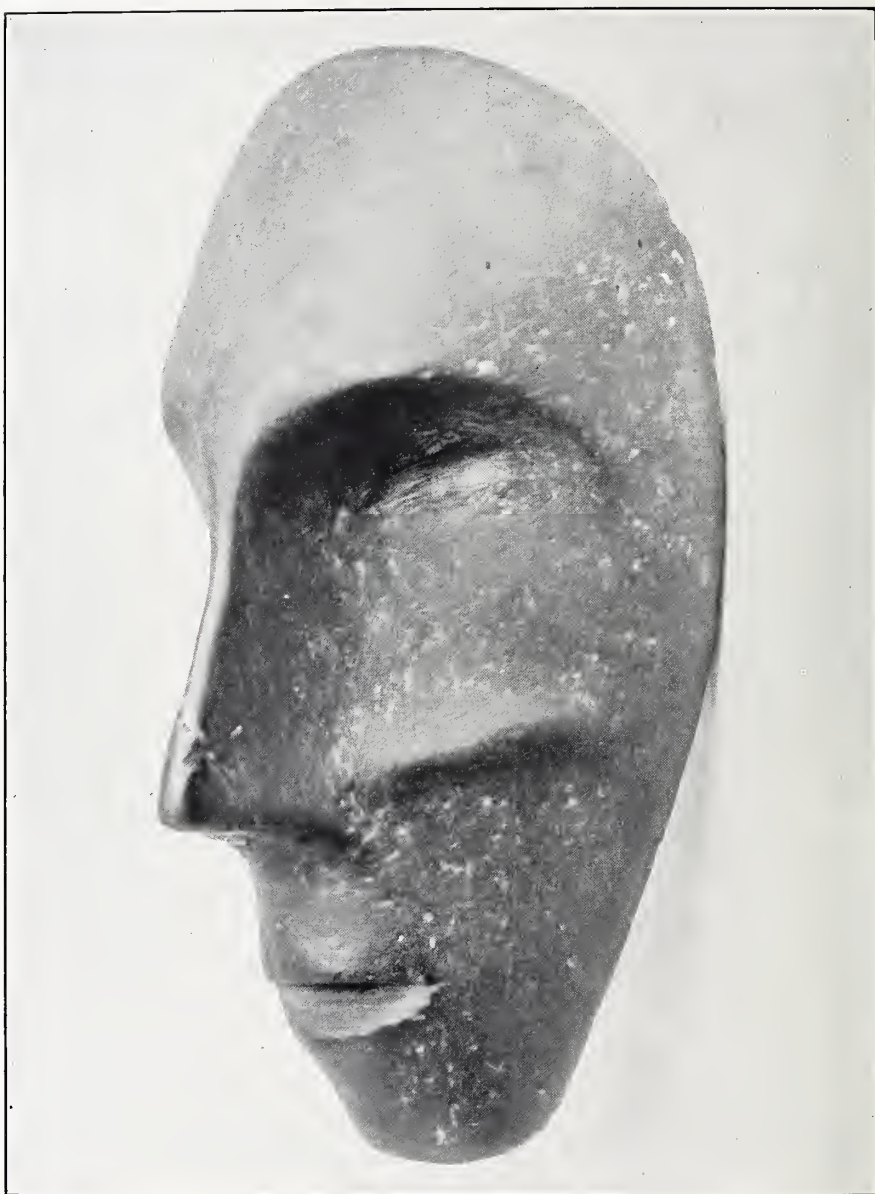
STONE IMAGE

Height twelve inches. Limestone
Found in Mound on Cumberland River, Trigg County



WOODEN IMAGE

Height twenty-six inches. From Bell County, Kentucky
Found among Cliffs surrounding Pineville



STONE MASK

Owen County. Doctor William E. Baxter

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The best three of these were in the Louisville Public Library, and if they have not been lost they are mislaid, so that they could not be found for purposes of photographing. The precise locality of their discovery is uncertain, and the details of their finding have now been lost. They are all carved in sandstone. Their similarity suggests that they were the work of the same class of artists and delineations of the same people. They are strangely alike in their general make-up—the receding forehead, the lifted chin, the broad face, prominent ears, protruding lips, and ring-shaped mouth. Two of them are females and one a male. They are all in sitting posture, and represent only the trunk of the human figure. All are flat on the bottom, so they may be able to stand upright and without support. It is a source of great regret that these have been lost to public exhibition. It is hoped that they may yet be restored to their original place in the Louisville Public Library. Efforts are being made to trace the present whereabouts of these images, and the archeologists will be delighted should these efforts prove successful. The illustrations on page 263 are not satisfactory representations of the originals. They were made from halftones of casts in the United States National Museum.

Professor W. M. Linney, formerly attached to the Kentucky Geological Survey, in a paper on the mounds explored by him in Boyle County (Smithsonian Report, 1881), mentions an image, or rather a bust of Aztec type, which was plowed up in Marion County, near Lebanon, and remarked that this object was in the Deaf and Dumb Institution at Danville. Efforts have been made to locate this image through one of the trustees of the Institution, but the attempt has proved unsuccessful. Unfortunately,

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Professor Linney gave no accurate description of it in his report.

Another unusual image was found in a mound on Cumberland River, in Trigg County. It is made of limestone, and is somewhat defaced by reason of the effect of the elements upon the material. The back presents much more defined and clear-cut lines than the face, the features of which have largely been destroyed by disintegration of the stone. The massive head, prominent ears, the elongated chin well thrown forward, create the impression on the mind that this was probably used as an idol. This image, in spite of its marred features, would produce, both upon examination and upon study, an impression on the mind of power and force. The height is slightly over twelve inches, and the width at the widest place, where the hands touch the hips, is five and three fourths inches. At the point where the ears project from the head it has a width of three and one half inches, and weighs about eight pounds. (See page 264.) There are many smaller images running from one to three inches in length. However, of these, few show any artistic skill or ability, and present the rudest forms of carving.

In the winter of 1869 Mr. L. Farmer, of Pineville, who was hunting for a fox among the cliffs which surround Pineville, in Bell County, found a wooden image of a man twenty-six inches high and in a sitting posture, with flat base. The oldest inhabitant could tell nothing of this curious find. Its whole appearance indicated prehistoric manufacture. It is a fairly good imitation of a man, and is made of yellow pine. Its features have been largely obliterated by time, although it was found in a place where it had been kept perfectly dry. One ear is visible

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with a hole pierced in it, as though once ornamented with jewelry. When exhibited in that part of Kentucky it was a great curiosity to travelers. It is the only prehistoric image in Kentucky of wood that has been thoroughly preserved, and the manner of its making gives evidence that it had been executed by artists who antedated the historic period. Its form resembles the stone images, as it is in a sitting posture with a flat base and was built so it would stand alone, and the pose of the arms is very much like that found in the images. (See page 265.)

In Owen County, about sixty years since, a superb mask was plowed up in a field and became the property of Doctor Baxter, and he in turn bequeathed it to his son, Doctor W. E. Baxter, of Frankfort, Kentucky, who now has it in his possession. An illustration of this remarkable work is found on page 266. The peculiar stone which enters into this face is somewhat unusual in this line of work. It is quite smooth and hard. The whole pose of the mask is dignified, and creates the impression that the artist had a conception of the higher and better forms of the human countenance. It seems that he was not simply making a representation of a face, but more likely he was giving expression to some living form that had come within his observation. The whole mask has an intellectual cast or expression. The mouth is firm, the forehead broad, full and straight, and the nose might be safely styled of the aquiline type. The forehead, which is massive and well developed, together with the whole expression, gives not only at first glance, but after close study, the impression of a splendid reproduction of a face that indicates a high degree of mind force and dignity.

Another image, found in Henderson County, Kentucky,

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is shown on page 275. This is of red sandstone, and was plowed up in the alluvial deposits along the banks of the Ohio River. In this image the mouth is wide open, the tongue extended, the eyes glare, the nose is depressed, and there is an expression of hideousness that makes one think of ogres and devils rather than of men. This image so widely differs from the other works of prehistoric art that it must be placed in a class by itself. It has marks which would indicate the use of metal tools, but its history and the story of its finding are all so thoroughly trustworthy that its genuineness can not be questioned. At one time it was on exhibition at the Louisville Public Library, but was subsequently turned over by Colonel Thomas W. Bullitt, upon whose farm it was found, to his daughter, Miss Agatha Bullitt.

PIPES AND SMOKING.

The records of mankind show that smoking, or inhalation of fumes of burning plants, was indulged in from time immemorial by the people of the East before they came in contact with tobacco or heard of the New World. The Chinese, who are never modest in their claims, assert that they always smoked, and that the use of opium was merely a change in material. Herodotus, Pliny, Plutarch, and other writers, relate wonderful things of the early smokers—how they inhaled the fumes of plants, barks, leaves, herbs, gums, and kindred mixtures. Columbus and his sailors had doubtless seen smoking before, but they had never seen tobacco smoked prior to the time they reached the American Continent.

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The French Ambassador to Portugal sent from Lisbon the first tobacco seed to Paris for Catherine de Medici, Queen of France, not for smoking, but as a remedy against the pangs of toothache. This Ambassador had come in contact with tobacco which had been transported across the ocean from the New World. His name was Jean Nicot, and in honor of this mixture his name was applied to tobacco, namely, *Nicotiana*. Whatever may have been the fancies, the customs, and the habits of the Old World as to various smoking materials, the greatest smoking product that has ever been known, or probably ever will be known, was found in the Western World.

When Columbus and his followers landed upon the shores of the newly discovered land they observed the natives blowing smoke and fire from their mouths and nostrils. They were not slow to discern the remarkable endurance of the new race, and they attributed this to some mysterious virtue connected with the practice of smoking. They were informed by the Indians that the leaf they used was a great medicine, which, besides guarding against hunger and thirst, was a sure remedy for every other ailment. Observing that these aborigines were free from many of the diseases to which they were subject, the newcomers accepted tobacco as a panacea for many human ills.

It has been claimed by some writers that smoking was not universal in America prior to the Columbian period, but that it was used altogether for ceremonial relations, or for purposes connected with the declaration of peace or war, and the cementing of friendships. In Kentucky at least this theory is hardly sustained by certain facts

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about which there can be no dispute. There have been discovered a large number of pipes which could likely have been used for ceremonial purposes alone, but there are still greater numbers of small individual pipes which, from their very make-up, demonstrate that they were used for personal and not for public service.

The newcomers looked upon smoking as a most disgusting habit. It was not confined to men, but was equally prevalent with women and children. With the curiosity incident to all travelers and explorers, they decided to unite with their copper-colored friends in this exercise, and borrowing from them their pipes, they regaled themselves with the fumes of the weed. In a little while they were all sick; they were disgusted with themselves and with the newly found smoking material. Some of the sufferers the next day experimented again, and were surprised to find that that which had made them ill one day, the next day had a sedative and soothing effect. They were pleased with the results of their dissipation, and so not only day after day, but hour after hour, they regaled themselves with their newly found stimulant, and became constant and steady smokers.

Very shortly after the discovery of the Western World tobacco was brought to the Old World, but the unexpected call on the supplies of the red men quickly exhausted their scanty store, and it was impossible to meet the pressing demands which came from across the water for the delights of this seductive plant, and at once the seed was sent over, and in many parts of Europe tobacco was cultivated. At first they adopted the methods of the red man, but the genius of the white man doubtless improved the cultivation, and brought with it better results. The

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Spaniards became the pioneers in the use of tobacco, and they were quickly followed by the French; but the English, while slow to take up the habit, soon outstripped their continental neighbors in its consumption. Sir Walter Raleigh was among the first Englishmen to lend his example. History says that "Queen Elizabeth was not averse to using the weed on certain occasions herself," thus being a forerunner of, if not a worthy example for, the modern cigarette girl.

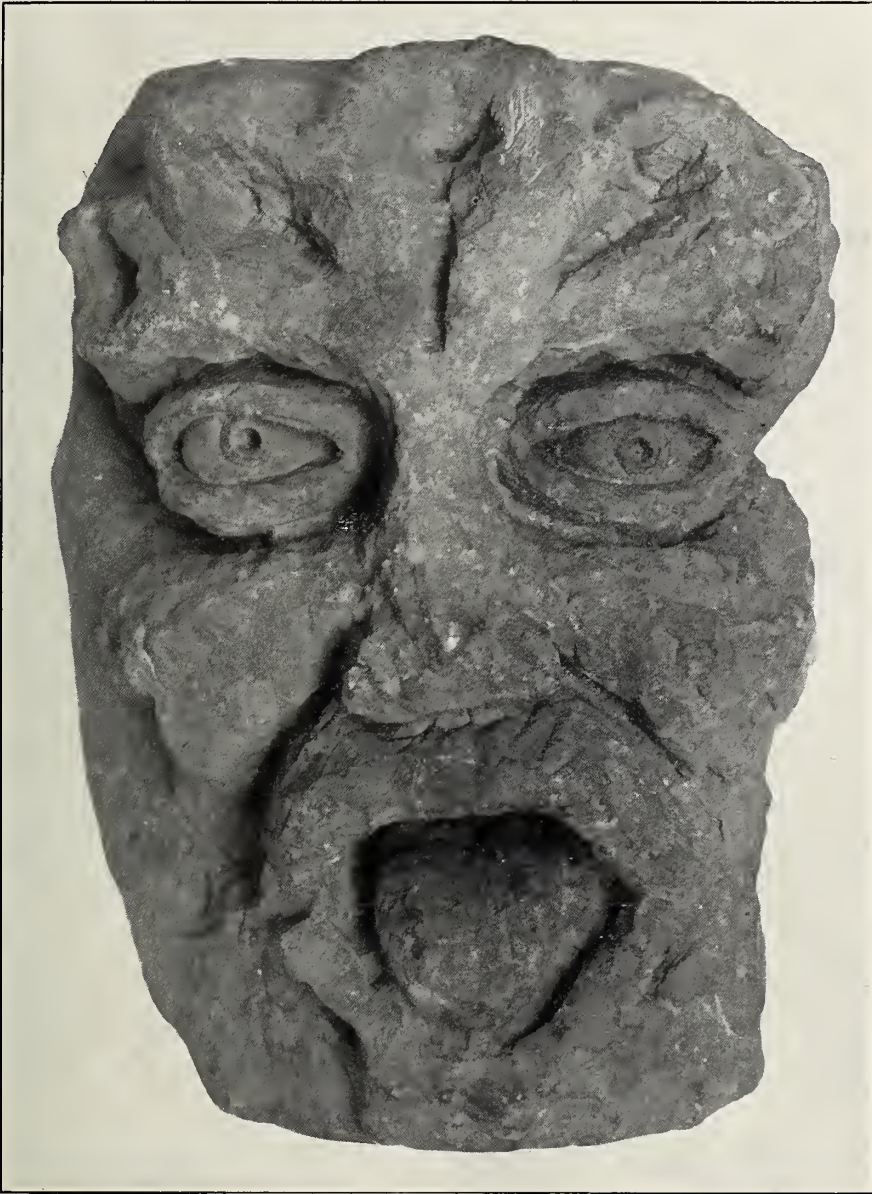
It is admitted on all hands that smoking was an important factor in the religious ceremonies of the American aborigines, and that hundreds of years before the coming of the white man they used tobacco in many ways and in great quantities. The Jesuits, who were the first Western missionaries, tell us that it was a part of every ceremony, religious or otherwise, and that it was a necessary adjunct to all of the red man's councils and deliberations and to the conduct of all business, and that pledges made under its influence were held inviolable. The red man believed that the Great Spirit had revealed the use of this plant to his forefathers. Whether or not his remote ancestors had heard of the incense offering to the gods, the man of the West, in smoking his tobacco, imagined himself thus brought closely in contact with his Supreme Being, and the first breath of his pipe was blown toward the sky and the sun, and was a part of his worship.

Strangers who visited the West, traveling under the mysterious protection of the calumet or pipe of peace, were not molested. Wherever the red man smoked this pipe of peace with the stranger, he was safe. When once the pipe was exchanged between men, peace was always the result of this mystic proceeding. Hospitality, friend-

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ship, and protection were represented in the sacred plant, and he who inhaled its mysterious smoke and together with his host sent the flames skyward, became bound by a compact as strong as that which united these people to their God, and he was deemed miscreant who for one moment forgot the tie and the obligations which this ceremony entailed. In going upon a mission of importance to another tribe or nation they performed the incense ceremony four times each day, first blowing the smoke to the four cardinal points, then to the sky, and then down upon the ground, thus invoking aid from all parts of space, and surely in one of these directions reaching the Great Spirit and placing themselves under the protection of the Being they worshiped.

The white man was not slow in imitating his red brethren in the use of tobacco, and soon became more excessive than his newly found friend in all the phases of tobacco consumption, and whether in smoking or snuff-taking, quickly outran the people who had first discovered and perfected the use of this remarkable weed. With the red man the pipe was the most important of all his possessions. Upon it he lavished his highest skill, and no weariness or labor caused him to hesitate in the necessary work of its preparation. The high esteem in which it was held is evinced by the great amount of labor and endless patience he expended in carving its forms. Axes and arrow-heads were built along many lines, but these ordinarily required no very great development or outlay of genius. When beveling and serration came into fashion, the Indian had made great advances in the art of arrow-making, but it was when the red man realized the soothing comfort and the sedative delight of tobacco that his artistic genius

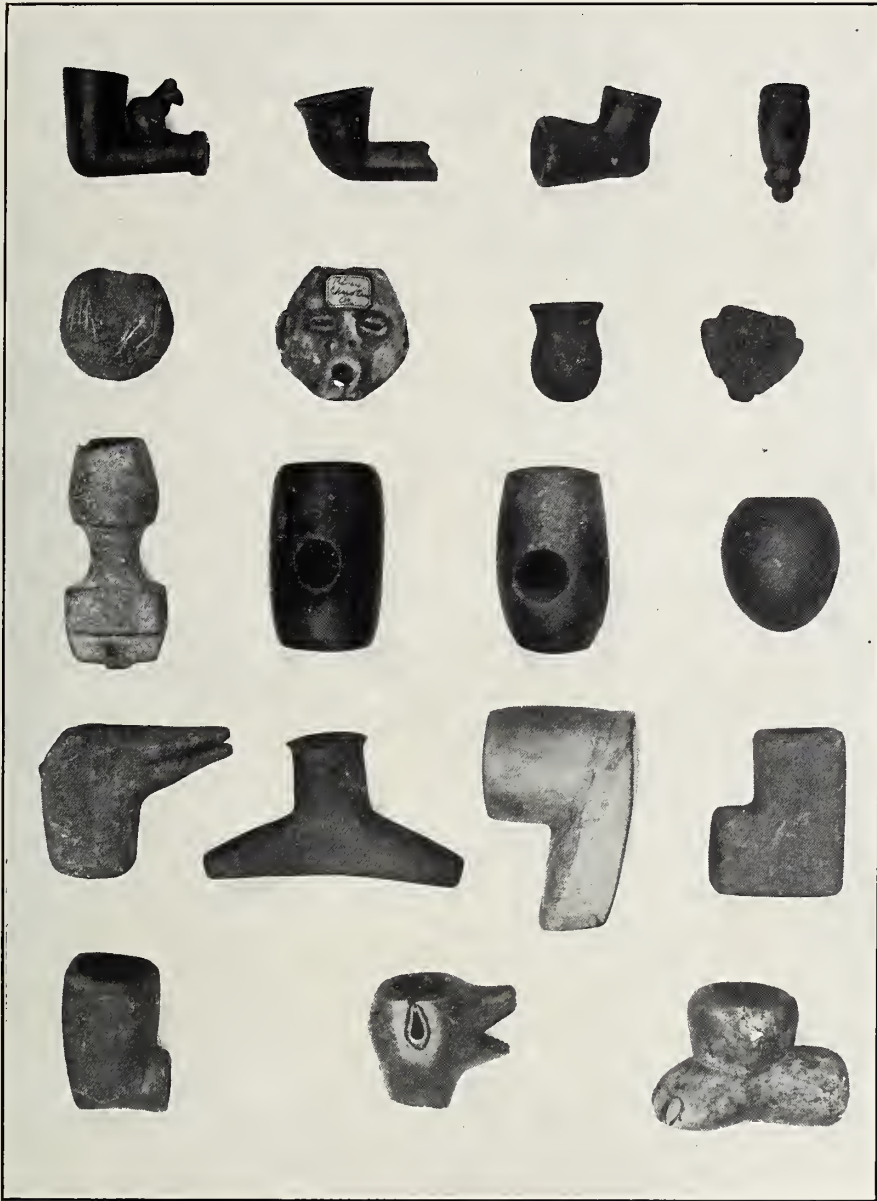


SCULPTURED HUMAN HEAD

Red Sandstone. From Henderson County, Kentucky
Property of Miss Agatha Bullitt



PIPES—TUBULAR FORM
Length of largest, ten inches



PIPES

About one half actual size. Miscellaneous Collection



PIPES

About one third actual size. Materials, Sandstone and Steatite



PIPES—STEATITE

Upper, Fulton County. W. P. Taylor Collection
Lower (two views), Cumberland County



PIPES—BIRD EFFIGIES
About one third actual size



PIPES—BIRD EFFIGIES

Upper, Steatite. From Montgomery County. Holt Collection
Lower, Crystalline Limestone. From Fulton County. Taylor Collection
One half size



PIPE—DUCK EFFIGY

Length, five and one half inches. Material, Steatite
From Bourbon County

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was quickened and incited to the highest skill to produce that which would be beautiful as well as convenient for his use. Comforting and pleasing to him in so many ways, as a matter of pride and gratitude he evoked all that skill and labor could suggest to ornament the pipe, which became his constant companion day and night, his friend on long marches or dangerous expeditions, and the talisman with which he disarmed the hatred and vengeance of his foes.

As soon as settlements were established in the New World and agriculture begun, tobacco became the chief product of the colonies. In 1616, at Jamestown, Virginia, laws were passed making tobacco currency. It was cured and sent across the ocean, and upon its arrival at its destination, used. It was deemed to be a panacea for a vast number of the ills of the body.

The red man used his smoke to allay storms on the water, the Italian to divert the evils and the asthma of the Tiber, and in England history tells us it was asserted that the devil was much afraid of tobacco and its smoke. The medical faculties of Europe prescribed its use in many ways, and its use quickly permeated every grade of society. When Columbus came, the tobacco leaf for smoking purposes was used in the shape of a rolled tube. Pipes were also common. The rolled tube was nothing more than the ancestor of the cigarette or cigar of to-day. In Mexico the people still largely use the cigarette in smoking. Besides this, the natives made mixtures or pills which they were accustomed to chew when crossing a desert where food and drink were scarce, thus at least imitating, if not antedating, the use of the leaves of the cocoa by the South American laborer.

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A French writer claims that the plant was named after an island by that name, but no such island was ever known. Doctor Joseph E. McGuire, in his interesting work, "Pipes and Smoking Customs of the American Aborigines," covers fully the details on this subject, and he concludes: "The name in all the modern cases appears to be derived from the American word tobacco." To this delightful work of Doctor McGuire's the author is indebted for much of the information contained in the previous parts of this chapter.

Whatever may have been the use of tobacco after its introduction in Europe, it was certainly used in Kentucky six hundred years ago. Pipes have been taken from mounds, the age of which is demonstrable to be of that period, and as early as that pipes of various forms were used, some large, some small. The larger ones were of such extreme size of bowl as to satisfy any observer that no man could stand the strain of smoking such a quantity of tobacco as would be required to fill these receptacles.

A recent find of two specimens of leaf tobacco, together with the seed pod of the plant in Salts Cave, conclusively shows that tobacco was used in Kentucky during the cloth slipper period. So far as the observation of the white man goes, this period of using cloth slippers either by men or women antedated the Columbian period, and Professor Putnam, whose opinion always carries weight on such subjects, is inclined to the belief that the objects in Salts Cave, with which this tobacco was associated, indicate a rather great antiquity. While there is nothing so far discovered in Salts Cave which indicates that the tobacco was smoked, its presence at this early period is an assurance that it was used either for smoking or snuff,

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and that certainly it was cultivated and cured in Kentucky five hundred years ago. It is rather a remarkable fact that among all the finds in Salts Cave no stone or pottery pipe has been found, nor are there any evidences that wooden pipes were used. It is not improbable, in view of these facts, that these cave-dwellers may have used their tobacco as snuff, or may have utilized the gourds for pipes, as is done with the calabash in the present period. Some of these gourds are not much larger than the bowls of some of the pipes used by the Mound Builders.

With the data now at hand it is not possible to determine the development of the pipe—indeed, many of the best specimens appear to be the most ancient. The splendid pipe shown at top of page 288 has a certain age of at least six hundred years. It was found in the roots of a beech tree which had grown on the top of a mound near Green River, in Hart County. The tap root had closed around the pipe when the tree was very small and just after the seed had burst the shell and sent its tiny stem heavenward. Here this splendid pipe remained for hundreds of years, until the mighty tree had reached gigantic proportions; then through a long series of years the tree remained stationary, and then began to decrease in power and vigor until at last, by a storm, it was laid low and the pipe again exposed to the light of day, which hundreds of years before had been the pride of its maker and which, to him who fashioned it, had brought solace in sorrow, courage in war, and contentment in peace, and which had doubtless played a conspicuous part in the lives of those who had lived in its day and near the home of its owner. The pressure of the root and the concussion in the fall of the

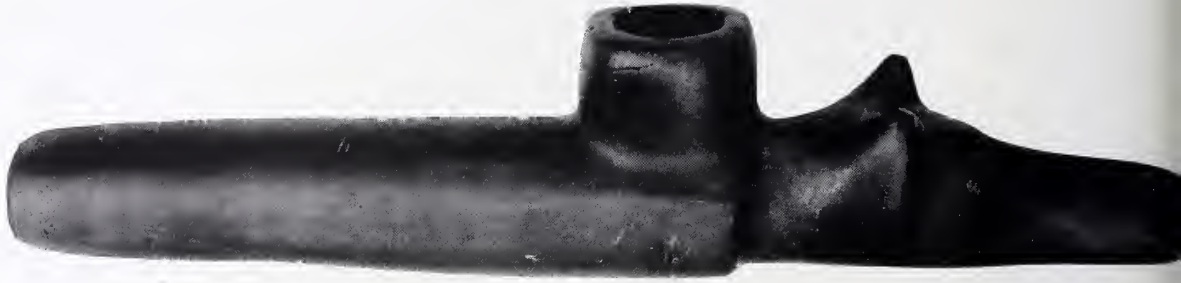
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tree broke the pipe into nine separate pieces. Colonel Robert Munford, of Munfordville, Kentucky, from whom it was obtained, and who was a most enthusiastic and zealous antiquarian, discovered the pipe in the root after the tree had been blown down, cut away the pieces that were holding it, and searched with intense diligence for the remaining parts of this splendid piece of workmanship that were lost. He moved the dirt carefully with his hands and with a sifter, and in the course of two or three months found every piece but one. With glue, which he had learned from the Indians to manufacture out of buck's horn, he welded the separate pieces into a beautiful whole again, but still one piece was lacking. For eight months he searched for this last piece until, like the woman in the Scriptures hunting for the lost coin, he found it, and his patience and courage were rewarded with the delight which can come only to an antiquarian when, after long months of toil and watchfulness, he finds that which he sought. The pipe was now restored to its beauty and its original attractiveness. The mound showed that other timber, certainly of an age antedating the beech tree, had sprung out of the earth which had been used to fashion it into form. Through these centuries the trees had grown, while beneath the surface, in the grip of the beech, the beautiful pipe, hidden from all that was bright and attractive, lay in the dark, damp earth. At last the storm had liberated it and brought it back into the sunlight again. In its mute and silent way it tells of the achievement as well as the genius of him who, hundreds of years before, had fashioned it with artistic skill into its present form. This unusual piece of Mound Builder's work is made of oölitic limestone. By its contact with the wood



PIPE—BIRD EFFIGY

Length, six inches. Material, dark reddish brown and very hard
From Trigg County



From Hart County. Seventeen inches long



From Montgomery County



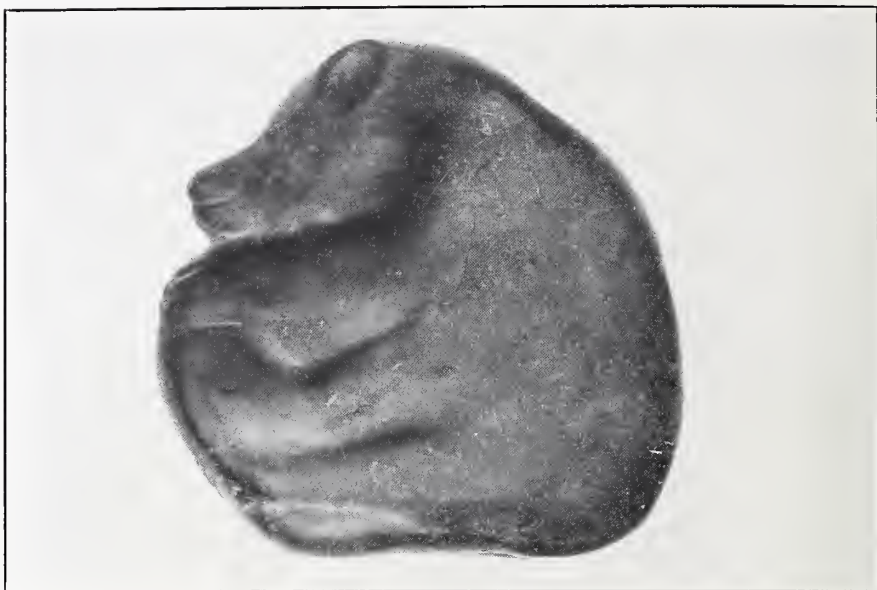
From Franklin County

PIPES



PIPE

Representing grief or despair. From Livingston County



PIPE—EFFIGY BEAR HUGGING MAN



PIPE
Steatite. Fourteen stem holes

The Prehistoric Men of Kentucky

it has the appearance of petrification, but a scratch shows this not to be so. It measures sixteen and three fourths inches in length; just back of the bowl it is seven and one half inches in circumference; the bowl itself is eight inches in circumference; the cavity for the tobacco is four and one half inches in circumference, and the pipe weighs seven and one half pounds.

On the page with this large pipe is found another very unusual form. Its details almost make one think it is of Mexican origin. It is made of Kentucky sandstone, and has a square hole at the base and round hole in the bowl, and has been fashioned so as to secure what would be called relief work. It was plowed up about ten years since in a cornfield, by a lad in Montgomery County. The point of the plow struck it and made a slight abrasion. Proud of his find, the boy brought it to Mt. Sterling, where fortunately it came under the eye of the editor of one of the papers, Mr. Joseph W. Hedden, who knew the writer's weakness for such specimens. He offered the boy a dollar for it, but the young merchant felt he had a more valuable possession than a dollar's worth, and insisted on eight dollars. The gentleman replied that he knew of but one man in Kentucky who was foolish enough to pay eight dollars for a piece of stone like the pipe in question, but would communicate with him. Upon writing the author a description of the pipe he immediately telegraphed that there was a man in Kentucky foolish enough to pay eight dollars for a pipe, and so it came along and took its place in his collection. The relief work, the arrangement of its lines, the square hole, the space cut between the bowl and the place for the stem, all mark this as a very unusual piece of prehistoric art.

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On the same page will be found another unusual and interesting specimen of pipe. It is made of a black slate, much heavier than the banded variety. This pipe was plowed up in a field in Franklin County, Kentucky. It passed into the possession of a gentleman who, being interested in antiquarian work, turned it over to the author. Unfortunately the former owner marred it by carving his initials on it, and either the man who made it or some subsequent owner carved a face on the square beside the bowl. The diameter of the bowl is three inches, the diameter of the place in which the tobacco was inserted is three fourths of an inch, and the hole at which the stem was inserted is practically the same size as the opening for the tobacco. The design, while quite simple, is worked out in very graceful lines, and its proportions are in every particular quite æsthetic.

The representation of another remarkable pipe will be found on page 289. This has been thought by many observers to be the most artistic pipe ever found in Kentucky. It is made of an apparently bluish limestone, and represents a man with his elbows on his knees, his hands about his face, while every line indicates one in deep distress or despair. The general effect is striking, and it certainly was a stroke of genius to work into a pipe created out of stone the idea of a human being in grief or sorrow. A companion piece to this pipe of despair is a man and bear struggling in conflict. (See page 290.) The legs of the bear envelope the man, and the man has the appearance of being hugged to death by the brute who has him in his grasp. In both of these pipes the bowl is small, and the place for the insertion of the stem is almost the same size as the bowl. These were found in Southwestern Kentucky.

The Prehistoric Men of Kentucky

The most exquisitely striking pipe that has been found in Kentucky is represented on page 279. It is made of black soapstone. The bowl is one inch in diameter, while around it is a projection very thin and measuring four and one half inches. The length of the stem is nine and one half inches, while the diameter of the hole along which the smoke was carried is about one eighth of an inch. The width of the piece of material through which the stem hole passes is two inches. The thickness of the stem is about three fourths of an inch at the widest part. The stone is quite soft, and the hole may possibly have been drilled by a piece of cane. The object is highly polished in all of its parts.

The pictures of pipes on pages 276-82, 287-95, and 295-96 will show the different forms and sizes of these objects. In the collection of the author are something like four hundred pipes, made of all sorts of materials, in many differing shapes. No two are really alike, and they display in their manufacture great originality and genius. They have been found in every part of the State, large ones and small ones, covering all parts of the Commonwealth's territory; some in mounds, some in graves, some scattered over the surface. All show not only that there must have been a large population, but that there was extended use of tobacco among the people of the mound-building period in Kentucky. No soil could have been found by the Mound Builder that would have yielded more generous returns for his labor in producing the plant; and as Kentucky now produces a very large part of all the tobacco grown in the world, it is possible that in these early days the Kentucky farmer had his tobacco patch and cured his crop and was ready to barter it to

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his red brother who would bring to him catlinite, steatite, shells, small and large, and other trinkets, which went to make up the things essential to the comfort as well as the luxury of his family.

There was constant expectation for quite a while of finding in some well-preserved form the deposit or residuum on the sides of the bowl which the smoke would make in the receptacle which was used for holding tobacco, but only in one instance has there been such indications as would show at all conclusively that the pipe had been used for any great period of time. The tobacco and the cane and the stone, all found in great abundance in Kentucky, put readily into the hands of the smoker all the necessary things to provide him with a convenient, comfortable, and tasteful pipe for the exercise of the smoking habit. Many of the designs of these pipes are taken from Nature, but very many of them show the development of really artistic talent.

DISCOVERIES IN KENTUCKY CAVES.

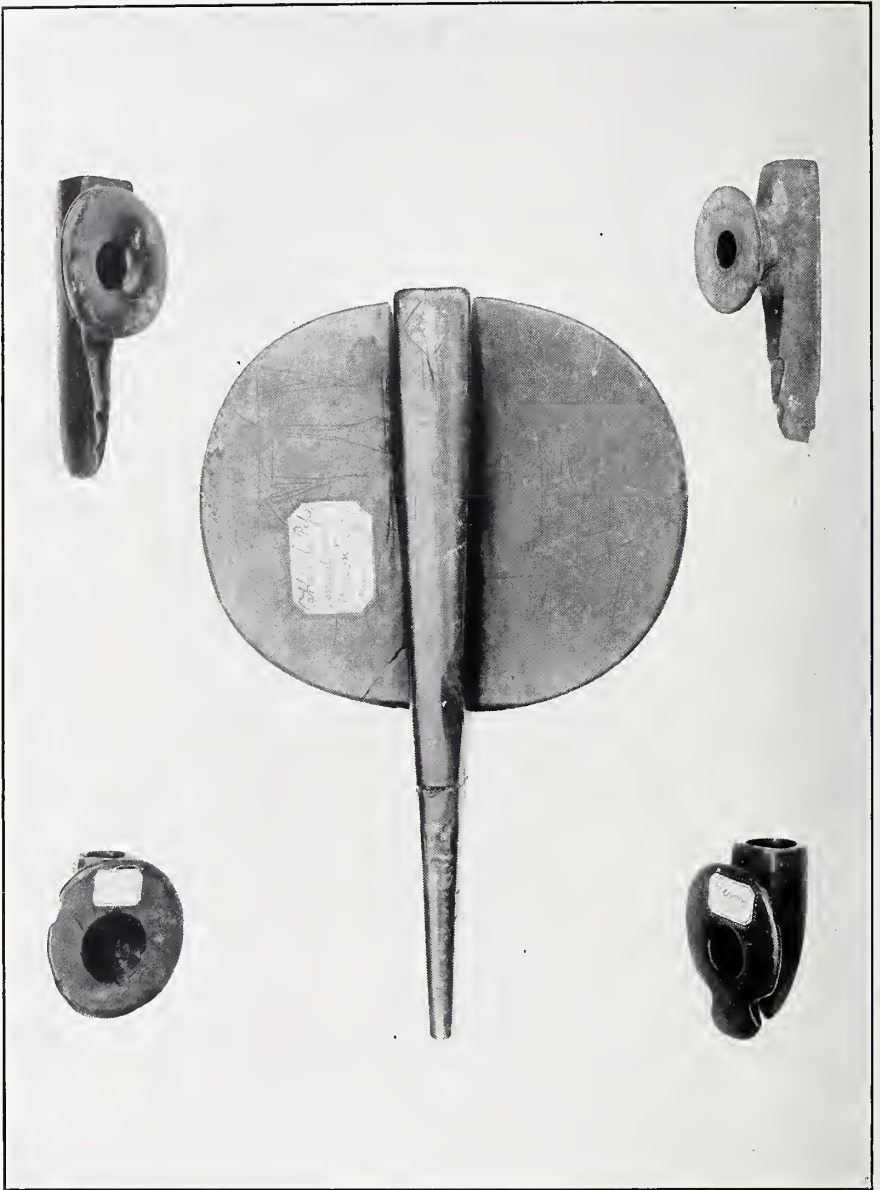
Those familiar with archeological research in Europe will recall that through caves are found the most satisfactory evidences of the habits, food, and clothing of primitive man. These were used as places of abode or refuge, and from the débris and ash-heaps of the substrata of the cavern floors the antiquarian has acquired the most reliable information as to what manner of man he was, and how and when he lived. In the occupancy of caverns in America, there is no prehistoric period corresponding with the "Cave Period" of Europe. Many of the caverns of Kentucky were used by the aborigines



PIPES—FROG EFFIGIES



PIPES—BOAT IMITATION AND ARTISTIC ORNAMENTATION



CATLINITE PIPES

Diameter of largest disk, six and one half inches; length of bowl, nine inches

The Prehistoric Men of Kentucky

as depositories of the dead, and several show that they were used, at least temporarily, as places of habitation, or retreat from enemies in times of danger; yet this occupancy was not of great antiquity, but seems rather to have been contemporaneous with the mound-building period.

In the limestone which lies below the coal measures of Kentucky is a remarkable development of cavern structure. The late Professor N. S. Shaler estimated that there is an area of at least eight thousand square miles where the subcarboniferous limestone lies in a position suitable to the formation of caves. The layers of this range in thickness from a few feet to three hundred and even more. In Edmonson and adjacent counties underground streams, the waters of which, charged with carbonic acid gas and aided by the mechanical action of particles of the sandstone above and pebbles from the flint beds of the limestone itself, have carved out, by a slow but irresistible process, wonderful caverns ranging tier upon tier, which for majestic size and beauty are without rivals. In Edmonson and Hart counties the writer has investigated three of the most wonderful of these caves, all in close proximity to each other, the entrances of which could be covered by an equilateral triangle measuring hardly more than three miles. These are Mammoth Cave, of world-wide reputation; Colossal Cavern, but recently discovered and noted for its magnificence, and Salts Cave, from which have been taken some of the most remarkable prehistoric textile fabrics and vegetable remains ever brought to light. Several other caves in this vicinity have also yielded relics of rare interest to the archeologist. In Short Cave, eight miles from Mammoth Cave,

The Prehistoric Men of Kentucky

was found the so-called American Mummy, exhibited many years ago at Mammoth Cave and now deposited in the National Museum at Washington. Connected with Colossal Cavern is a small cave known as the Bed Quilt Cave, so named because of the finding there, some years ago, of an Indian mat resembling a quilt.

Salts Cave, the most prolific in prehistoric relics and rivaling even Mammoth Cave in the size and grandeur of its avenues and chambers, was known nearly one hundred years ago, and though often visited has never been thoroughly explored, and little has been written of its remarkable evidences of prehistoric life. In fact, apart from the few accounts of the so-called Mammoth Cave Mummy, published in the early part of the last century, no scientific study of cave life in Kentucky was undertaken until Professor F. W. Putnam, of the Peabody Museum of American Archeology and Ethnology, together with members of the Kentucky Geological Survey, visited and partly explored Salts Cave, and gave to the world an account of some of the wonderful things which, through this cave, were traced to the people who inhabited Kentucky centuries ago.

There appears to be practically nothing written on the early discovery of this remarkable place. There is one date in the cave as early as 1818. It has been the custom of many visitors in these and various caves to inscribe by some method their names on the gloomy walls, and thus leave behind them evidence of their presence at a given period. The next date so far discovered is 1843, and this is accompanied by the names of persons who were well known in the vicinity, and recalled to have lived in the neighborhood about that period. No definite

The Prehistoric Men of Kentucky

statement as to the discovery of Salts Cave can be found in any printed matter which is attainable. After inquiry among the oldest men now residing in that locality, including Squire O. P. Shackelford and Mr. A. B. Johnson, both of whom have lived all their lives near the place, it is probable that the first white man who ever saw the cave was William West, who it is said patented the land covering it about 1794. Squire Shackelford distinctly recollects his father telling him, when he was quite a young man, that the cave was explored first by Peter Kinser, who, upon entering it, remained in it a week examining its passages, and Squire Shackelford's wife found a mocassin in Salts Cave in 1851.

The Mammoth Cave and other caves in the vicinity were explored for the purpose of securing saltpeter during the War of 1812, but Salts Cave, although containing large quantities of the elements from which saltpeter could be made, does not appear to have been invaded for this purpose. There are places in the walls of the cave which indicate that some kind of digging had been carried on, but it is the opinion of those who have been most observant of these matters that these excavations, which are quite extensive, were made by the prehistoric people. The condition of the walls now shows that the excavations were made with sharp-pointed instruments, such as are now found in the cave, similar to the sticks used for planting tobacco, cabbages, and other vegetables. In one portion of the wall there are disturbances of the earth which contains clay apparently akin to ochre. Markings on this clayey material show that it was scratched or torn loose by the use of sharp-pointed wooden digging implements.

The Prehistoric Men of Kentucky

In 1893 Mr. Theodore F. Hazen, since deceased, and his wife opened a new entrance into Salts Cave more easy of access than that described by Professor Putnam, and nearer to the great central chambers and larger avenues of this wonder of Nature, and undertook a more thorough exploration of its labyrinths. From them we obtained many interesting relics, which aroused a desire to know more of this cave and the home life of the people who once occupied it. In 1894 the author first visited this place, gaining access by the Hazen entrance, which has since become closed by a fall of rocks and earth. Now the only available entrance is about a quarter of a mile from Sell's store, just within the Hart County line. The mouth, difficult and even dangerous of access, lies at the bottom of a deep sinkhole, and is but a few feet in diameter. A stream of water from a small spring above trickles over the entrance and into the cavern, quickly losing itself in the masses of rock which have fallen from the roof. This aperture, just sufficiently large to admit the body of a man, gives little promise to the explorer of the wonders awaiting him in this great temple of darkness and night.

After entering this opening and descending a steep declivity covered with rough jagged rocks, the main avenue is reached. Stretching away for miles, this is covered with great masses of stone fallen from the roof above. At the time of the occupancy of this cave by the prehistoric people, there may have been another entrance known and used by its inhabitants. About the present entrance numerous spalls, flakes of flint, pestles, axes, awls, and other implements have been found, indicating that a prehistoric village was located at this point. North of the



MOCCASIN
From Salts Cave



MOCCASIN
From Mammoth Cave



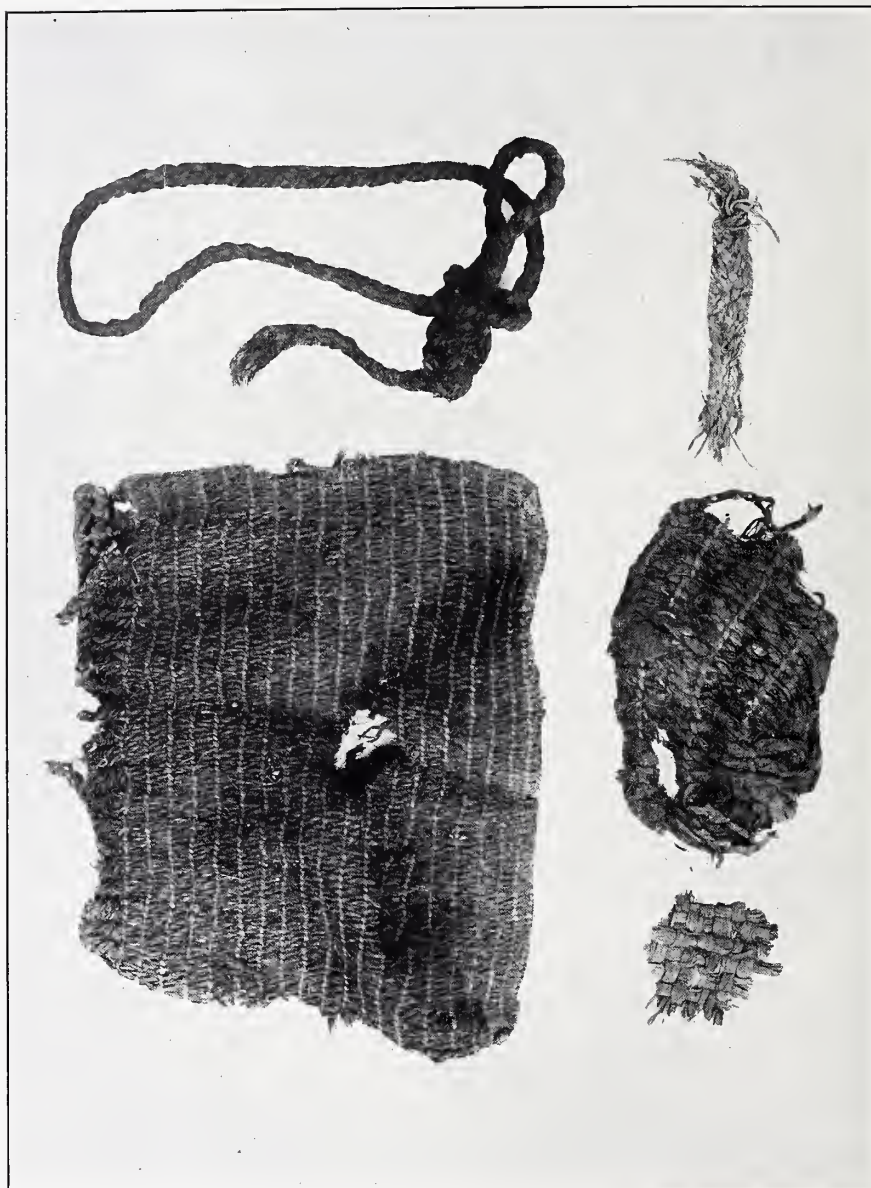
RETICULE
From Salts Cave



MOCCASINS
From Salts Cave



SPECIMENS OF CLOTH
Size one third. From Salts Cave



BAG OF WOVEN CLOTH—Size seven by nine inches
Fragments of textile fabrics and plaited rope
From Salts Cave

The Prehistoric Men of Kentucky

entrance about a mile and a quarter are other traces, which show that a village site at some time was located there.

This cave is perfectly dry in all its three tiers, with two exceptions—the spring which pours through the entrance and which loses itself a short distance away, and a small spring at the far end of the cave, several miles from its mouth. Close to where the spring enters at the mouth of the cave, at the foot of a rather steep acclivity, we found a large bed of ashes. Upon digging into these ashes, over a space sixty by fifty feet, they were found to vary in depth from two inches to two feet. They covered human and animal bones. These bones seem to have been cast in without regard to any particular order. Several skulls were obtained, and quite a number of lower jaws in which the teeth were yet intact. A large proportion of these jaws indicate that in life they were part of the bones of young people. In several the second set of teeth had not cut through, but were found under the milk teeth. At this point there is some dampness in the soil and the bones were not well preserved, and when exposed to the air and touch quickly crumbled. The remains of the animals found at this place were in a much better state of preservation than the bones of the human beings. These human bones were in the crevices between the stones. Above them were ashes, placed either by design or accident, and on top of these ashes fires had been kindled. It is therefore uncertain whether the people who built the fires knew of the existence of the bones.

Along the main cavern for several miles are numerous fireplaces and ash-heaps; occasional small piles of stone, evidently placed to hold fagots, used in lighting; innumer-

The Prehistoric Men of Kentucky

able partly burned torches of cane reed, and even the footprints of the men who, hundreds of years ago, walked along these majestic avenues. The cave contains a large amount of saltpeter, and has a mean temperature of fifty-four degrees. The atmosphere of the interior is dry and pure, and this, together with the nitrous matter in the earth, has produced conditions favorable to the preservation of all kinds of materials. About the hearths and fireplaces were found hundreds of fragments of gourds, and also some shells of the ancestral forms of the cultivated squash, both of which were in an excellent state of preservation. Torches of reed, to be counted by the thousands, which had been filled with grease or soaked in oil, traces of which may still be seen on some specimens, appeared as if they had been cast aside but yesterday. Along the main avenues and the second or lower layer of caves, as well as in many side avenues, these torches were found. Those who have spent much time in this cavern say that they have discovered no places where these and other traces of aboriginal man are absent.

Among the most interesting discoveries were a number of neatly braided slippers or sandals, and fragments of textile art. Several materials seem to have been used in the manufacture of these. Some were made of the fiber of the cat-tail or *Typha*, a plant which grows abundantly in the ponds in the southern part of the State. Others were woven of the inner bark of trees, probably the papaw and linn. Still others were made of what appears to be the fiber of wild hemp, and yet others from a species of grass which grew in great abundance on the Barrens of Kentucky.

The sandals show several distinct forms of braiding;

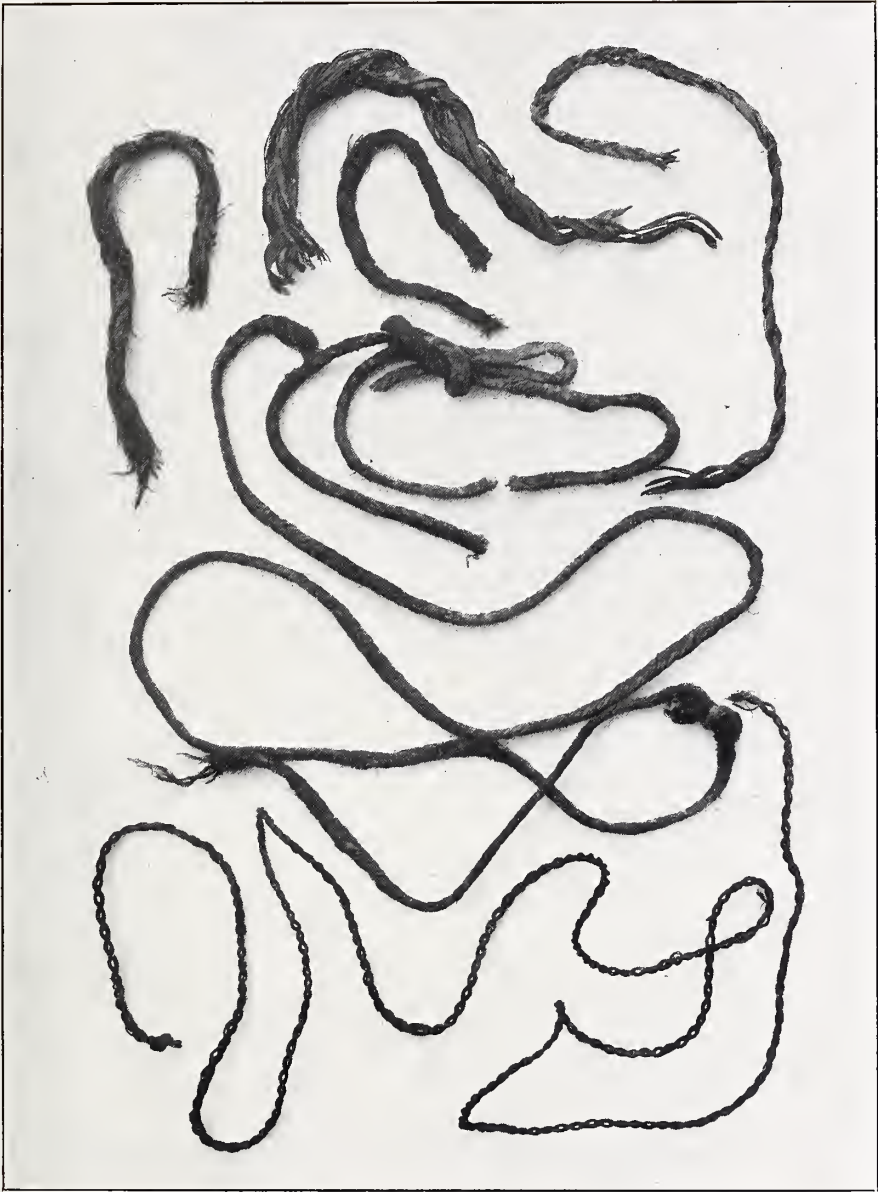
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the material of the more delicate and graceful appears to be the wild hemp, and the plait on the outer side exhibits a beautiful triangular figure. They have raised sides from the heel to the toe, the braids being worked forward, uniting in a seam in the middle line above the toes. Over the instep many were laced with cords, the lacing still being preserved in some of the specimens. Frequently long ornamental tassels were placed above the instep. These slippers are found in the crevices of the rock and on the ledges in out-of-the-way places, where they evidently had been cast aside by these people. All show signs of wear at toe and heel. Several display a more or less skillful attempt on the part of the owner at mending or darning. This was done sometimes with cord, but frequently with bark. In size they vary from small ones, made for children, to specimens corresponding to a number seven shoe. Their form indicates that the wearers had short, broad feet, somewhat smaller than those of the men of to-day. Page 302 illustrates several varieties of these sandals. The manufacture of these articles was carried on extensively in the cave, as is well attested by the large quantities of raw material discovered, much of which is strewn around the floors, some neatly tied up in small bundles of convenient size. A short while since a child's moccasin similar in most respects to those described above was found in Mammoth Cave. This slipper is so thoroughly preserved as to be capable of being handled and even doubled up without injuring any of its parts, demonstrating that there must be some substantial difference in the atmospheric conditions in Salts and Mammoth Cave. An illustration of this slipper will be found on page 301.

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Professor Putnam found a piece of cloth about one foot square, woven of the inner bark of some tree. This fabric was especially interesting, showing that it had been dyed with black stripes, the corner exhibiting a place where it had been mended or darned. A mat about one yard square was discovered several years ago in a chamber of the lower tier of the cavern known as Mummy Valley, so called because there was found there many years ago, by Messrs. Cutliff and Lee, the body of a young woman of this lost race.

Among the most interesting of the writer's finds are the braids which were evidently prepared for ornamentation of their clothing. These were made with three, four, and five threads, varying in shape from flat to slightly oval and box-shaped. Four well-defined pieces of cloth, which would appear to have been parts of some garment, have been brought out and are in a practically perfect state of preservation. One of these recent finds, which is now in the author's collection, is a piece of cloth which carries a white stripe at regular intervals. The method of use of this particular white piece of woof shows that it was bleached before weaving, and both sides of the cloth are exactly of the same appearance. The warp apparently has been made of twisted thread of cat-tail, while the woof or cross-thread is made of hemp. The white thread, which was the filling or cross-thread, runs in parallel lines through the fabric, three eighths of an inch apart and with absolute regularity. The strands of warp were apparently interlaced with each other and the cross-thread, and this was done with great evenness, as much so as if woven with the machinery of the present time. As they had no material from which white thread could



PLAITED ROPE AND CORDS OF BARK, WILD HEMP,
LEAVES OF CAT-TAIL, AND GRASS

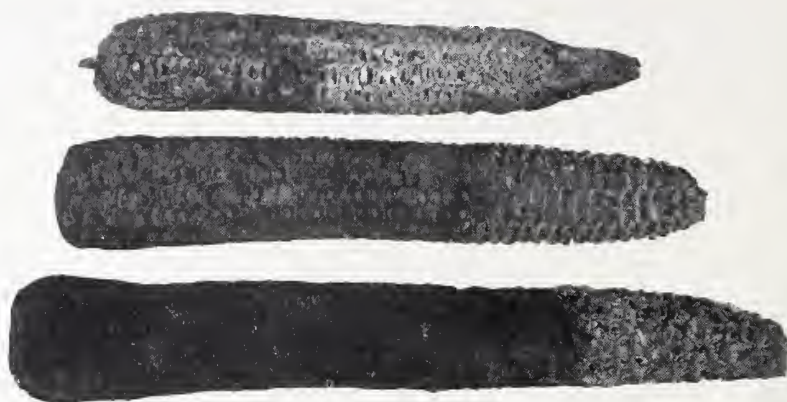
From Salts Cave



RAW MATERIAL, PREPARED FOR PLAITING AND WEAVING
Size one third. From Salts Cave



BASKETWORK HEADRESS
From Salts Cave



CORN COBS
From Salts Cave



CANE TORCHES—HALF BURNED
From Salts Cave

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be prepared, it is apparent that by some process they bleached this woof or cross-thread white before it entered into the body of the material. Black dyes would not be difficult. Red dyes might be easily obtainable, but the bleaching process used in producing the white thread would not be so easy. An illustration of this cloth will be found on page 303.

The author discovered a number of pieces of plaited rope and small strings or cords of twisted fibre, many containing knots. A piece of the rope showed that it had been broken and spliced. It is interesting to note the several kinds of knots that were tied by these people in the various work which was done in the cave. The ropes have something similar to our sailor's knot. The fagots were tied with what we call hard knots, that is, by two wraps and pulled together; occasionally by well-formed bowknots, such as we now tie in cords and shoestrings.

There were also found a partially burned torch, consisting of three reeds bound together with bark; a bundle of fagots tied with the same material; pieces of wood showing the marks of cutting instruments of stone; a small digging implement resembling the dibble used by truck farmers in making holes for setting out tomato, tobacco, and cabbage plants. Another wooden implement was found about two feet long, pointed at one end, and bore the appearance of having been used for digging in the earth; pieces of mussel shell, showing much use as cutting or scraping tools; dishes and vessels made of segments of gourds, several of which had been cracked and were mended by holes bored on either side of the fracture, through which a cord was passed, binding the parts together tightly. One half of a well-formed bowl or platter made of

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sassafras wood was also brought out. Professor Putnam, in his explorations, discovered a similar specimen. Many years ago, in a chamber in Mammoth Cave, was found a wooden bowl, which for a long time was preserved in the museum of the American Antiquarian Society at Worcester, and which is probably the same mentioned by Mr. Gratz and given by him to Doctor Mitchell more than seventy-five years ago—possibly the one from which the Wooden Bowl Room takes its name.

About two miles after leaving the mouth, under a shelving rock, was found firewood, as much as a wheelbarrow load, cut or broken to uniform lengths. After this firewood had been piled under the shelf where now found, a stone was placed in front of it in order to hide it from others who might pass that way. All the conditions surrounding it would indicate that some one of the people who lived in the cave had prepared this for his own personal use, and fearing that it might be taken from him had covered it over with the stone standing up against the other ledge, so as to conceal its presence from the ordinary observer. Here through the ages it had remained undisturbed and unused. The man who reduced the sticks to proper length for use at the family cooking-place lost out in the darkness, or maybe in some battle, and the man whom it was feared would appropriate the ready-made fuel never came, and it remained hidden until the pale-face successor of landed title came into the cave to search for traces of his red-skinned predecessor, and so, centuries after, the prepared wood reveals the domestic habits of the men who had passed into the oblivion of ages.

One of the most recent finds under the direction of the author is a squash cup. The squash seems to be less

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preserved than the gourd shells. The squash had been cut in two and about two thirds of it left, which had been nicely cleaned out, the top of the shell or rind smoothed, and it had been used for a drinking cup, as the modern people used gourds, only it would have no handle. An illustration of this unique cup is found on page 318. There was also found a gourd bottle. This was made from a gourd of unusual form, and was not the same as the sugar-trough gourd from which most of the fragments that have been found in the cave have been taken. It is a gourd unknown at the present time. It is harder and smoother than the sugar-trough variety so familiar to the Kentucky housekeeper sixty years ago. At the top of the gourd had been made an opening two inches in diameter, perfectly round and smooth, well shaped, and which showed that this had been used most probably as a drinking vessel or sort of canteen. It is six and one half inches in height and has a capacity of half a gallon. (See page 320.)

A large gourd vessel recovered, which was probably half of an average sugar-trough gourd, plainly shows one method this people applied in cooking their food. On the inner side of this utensil, just at the point where the water would reach its greatest height, there are indentations or depressions and several charred spots, and these spots or depressions are evidently made from some hard and hot substance pressing against the walls of the vessel at that point. We are therefore safe in saying that the vessel was filled with water, heated stones were put into the water, and it was easy in this way to produce, in the gourd dish or pot, boiling water, which could be used in preparing corn, squashes, beans, and other vegetables for table use.

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In January of the present year was discovered in the lower avenue of the cave a beautifully woven bag, resembling the old-fashioned reticule. It measures twelve inches in length by eight inches in depth, and has two handles of plaited cord and several loops about the mouth, evidently designed for the passage of cord or perhaps a stick in order to keep the mouth closed when filled. When first seen this interesting relic was lying upon the floor of the lower passage beneath a fissure leading to the upper gallery, through which it had evidently been dropped by the owner, who, unable to descend through the crevice, which was not large enough for the passage of the body, and not knowing a way to the chamber below, had given it up as lost. It was filled with small pieces of gypsum, and when picked up by our guide, the weight caused it to break and fall to pieces. Though badly damaged the fragments of this remarkable relic were carefully taken up and preserved. This bag is similar in many respects to the one described by Mr. Merriam as having been seen by him in 1815 with the mummy at Mammoth Cave. On page 304 is shown a small bag in an excellent state of preservation. About the mouth, which extends from side to side, is an ornamental border. The guide insisted that this is not a bag, but a cap or headdress. Near this article were found a number of feathers of the wild turkey and of the eagle, many of which have been cut off near the end of the quill, and some have holes through them. Among the most pathetic finds in this cave is a little reticule made of fiber of the wild hemp. This little bag measures two by two and one fourth inches. The cord or string which closed the top is in a perfect state of preservation, and the bag itself has neither a



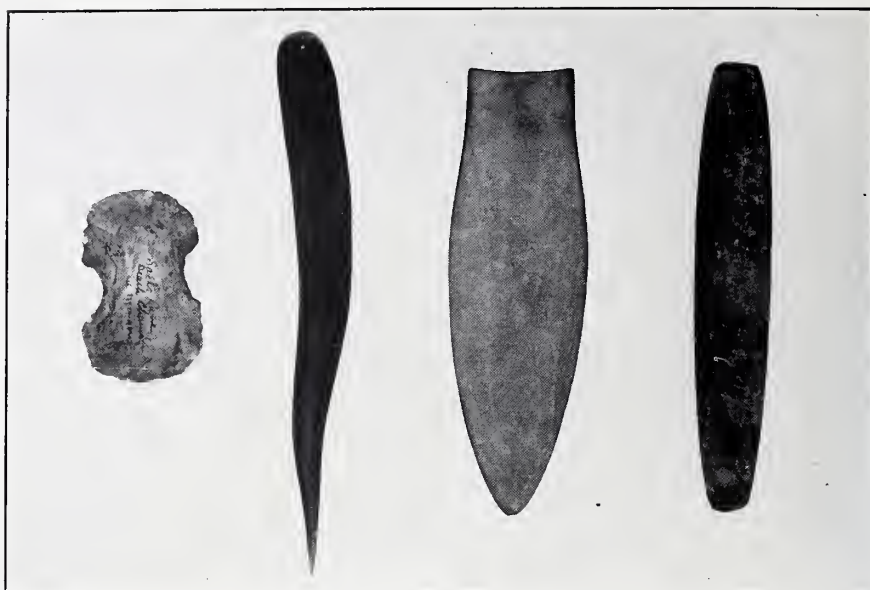
ABORIGINAL LADDER

Length about five feet
From Salts Cave

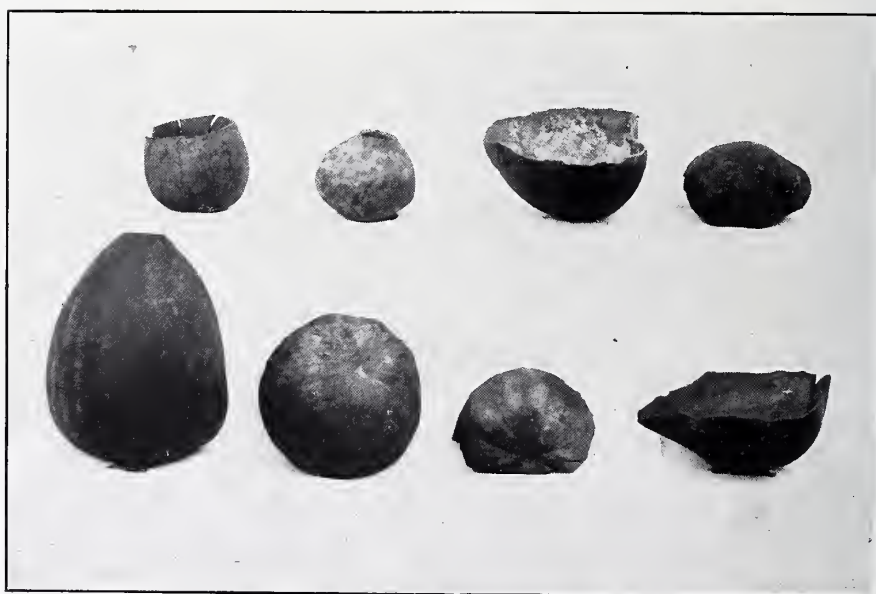


WOODEN DIGGING IMPLEMENTS

Length of longest about twenty-four inches
From Salts Cave



IMPLEMENTS FROM SALTS CAVE



CUPS, DISHES, BOWLS, AND WATER BOTTLE
Made of Gourds and Squash Rinds. From Salts Cave



GOURD
From Salts Cave



GOURD WATER JUG

From Salts Cave. Capacity about one half gallon

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tear nor rent. This piece of hand work indicates that maternal and paternal love was as strong and watchful among the inhabitants of the cave as can be found at the present period among civilized people. The care and patience required in the production of this little receptacle, evidently used by the children, would mean as much expenditure of time and labor to these prehistoric people as the silver mesh bag of this day would demand from the father or mother who were providing for their offspring something in which to carry their childhood's treasures.

Very recently there have been brought out two articles which first had the appearance of baskets, but those who have seen them insist that they are hats, and were used for wear on the head, either by men or women. They are made of split cane, woven with great regularity, the strips being a little more than one eighth of an inch in width. One of them when found was in a perfect state of preservation, but as soon as exposed to the outer atmosphere lost its power of resistance and dropped in the center, but without materially injuring the material from which it had been made. An illustration of the larger of the two articles will be found on page 311. They are remarkable in the regularity of the pieces of cane which entered into their forms. They were made of strips from the outer surface of cane.

Near what is known as Cumberland Gap was found an unusual object (see page 317). Resting against a ledge or shelf of rock was an aboriginal ladder, just as it had been placed centuries ago. It was made from the trunk of a small oak tree, and was five feet in length and three inches in diameter at the lower end. Five limbs, extending at an angle of about sixty degrees from the trunk,

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had been hacked or beaten off with a blunt implement such as a stone ax or celt, leaving some four to six inches projecting. The lower end or body of the tree showed that it had been felled by fire, while the upper end also indicated the application of fire. A smoothness upon the projecting limbs tells that this object had seen much service. Upon a ledge near by, in the cave dust, undisturbed for many centuries, were found several footprints, so distinct as to show that they were made by one shod with the braided cloth slippers of which this cavern has yielded so many. Since the shorter ladder was brought out, another has been found made from a small cedar tree or limb, being twelve feet in length, and discovered in the position in which it had been placed by these people when they ascended from a lower to an upper ledge.

In many places in the cave, along the paths over which these people traveled in their journeyings through its passages, the stones upon which they stepped have been worn smooth and slick. As those who traveled along these paths used braided slippers, it must have required an immense number of steps to have worn down the stone surface to the smooth condition in which it now exists. This would indicate either that the cave was inhabited for a very, very long time, or was filled with a large number of people at some period of its past. In interior chambers, heretofore unvisited by the white man, our guide observed many footprints upon the surface of the floor.

Stone implements are exceedingly rare in Salts Cave. A notched flint ax, a chisel-like celt, a pestle, and several arrowheads comprise all our finds. Pottery ware is also scarce, but near one of the fireplaces, probably used for culinary purposes, was found an earthen vase. In this

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had been placed a human bone, which had evidently been put there before thoroughly dry, probably while flesh was upon it. The stained sides of the vessel showed that it had absorbed some of the oil from the bone, and cave rats, in their search for food, finding the vessel containing the bone, had gnawed both the bone and a portion of the side of the vessel.

A complete demonstration of the fact that these people had different kinds of corn is shown by the cobs found now on the floors of this cave. Pictures of three of these are reproduced on page 312, and while men of the present age are disposed to magnify the superb corn products of this particular period, one of these cobs measures eight inches, and would be a fair exhibit in a corn show of 1910. These cobs render it certain that they had at least three different varieties, one the larger grain, probably white corn, a second more like stock corn, another closer and shorter, similar to our sugar corn. All these cobs indicate that the corn grown so many hundreds of years ago in Kentucky was not greatly inferior to that which is being produced at the present day.

A sunflower head was picked up in a reasonably good state of preservation, but the seed had entirely withered. All the substance in the seed pod had disappeared. Part of a sunflower stalk was found, measuring two and a half feet in length. Vast quantities of wild grapes had been carried into the cave. The stems are found now scattered along the floor, in a fair state of preservation. These were the wild fox grape so common in all Kentucky forests, and which, with the coming of frost, when fully ripened, are pleasing to the taste and extremely nutritious. There was also found a melon rind, apparently of the

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watermelon. Upon exposure to the atmosphere it disintegrated, and unfortunately was dropped from the table and broken into fragments. Numerous seeds of watermelon were found scattered along the avenue, and in such position and condition as to show that the melons themselves had been eaten by these cave-dwellers. A careful examination of the human excrement, now discoverable in several parts of the cave, shows that sunflower seed was an important part of the diet of these cave-dwellers. Watermelon seeds were also present, and here and there a fragment of a hickory-nut shell.

This cave has surrendered absolute demonstration of the growth and use of tobacco in Kentucky at a period contemporaneous with the Mound Builders. Mr. Samuel G. Tate, in exploring its labyrinths at my solicitation, picked up three pieces of leaf tobacco. (See page 325.) It was found in close proximity to the places where the inhabitants of the cave had their workshops, fires, and domestic gatherings. This find is probably the oldest specimen of tobacco in the world. Amidst the darkness and isolation of this weird underground habitation, covered with the cave dust and preserved by the meteorological and chemical condition of its gloomy chambers, it has lain untouched through centuries, but now, exhumed and brought out into the light of the sun, it is a mute but indisputable witness to the joy and pleasure of the mysterious inhabitants of this dismal abode, where night never ceased, in the soothing and sedative influences of what these people doubtless esteemed one of the Great Spirit's best gifts to man. When first handled it was as soft and pliable as buckskin, but upon exposure to the outside atmosphere became stiffened and brittle, and upon touch would



TOBACCO LEAF AND SEED POD

From Salts Cave



CEREMONIAL BOWL
Carved of Indurated Clay.
Found in cave in Clinton County

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crumble into minute fragments. With it was what experienced judges of tobacco say is the seed pod. This would indicate that the entire plant was cut off and carried into the cave.

The only thing to produce life brought out of this cave was the seed of a gourd. In 1894 Mr. Hazen found near the fires and the other remains which evidenced a particular place of abode, a large sugar-trough gourd high up on a shelving rock. The vessels, dishes, and thousands of fragments found in the cave were almost exclusively from this sugar-trough variety. The dust of ages was on this gourd when discovered. It was given to the author and was placed in his cabinet. About 1900 it was thought possible that the seed of this gourd might germinate. The extraordinary preservation of the gourd dishes and cups in this cave without apparent disintegration, and in as good condition as a gourd which would have been exposed for a year to the outside atmosphere, induced the hope that possibly in the dry atmosphere, and preserved by the impervious qualities of the gourd shell or rind, the seed from this specimen might retain vitality, and thus we would be able to reproduce the exact gourd which these people had used so many hundreds of years before, in the habitation of this cavern. This type of gourd contains usually about five hundred seeds. When taken from the gourd these seeds appeared to be firm and hard, and when opened, apparently were yet capable of germination. The statement was made through the *Louisville Courier-Journal* that these seeds would be distributed to such persons as might ask for them, and quickly they were scattered all over the United States. Ten gourds would not have supplied the demand, showing

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extraordinary interest in the reproduction of this ancient melon. The supply of seeds was quickly exhausted. One hundred of them were planted in the immediate vicinity of Louisville, and of these, four produced small vines. One alone survived the dangers incident to young gourdhood, and this had been planted on the farm of Mr. Henry Schmutz, on the Seventh Street Road, a mile south of Louisville. It exhibited great vitality, and grew with a rapidity which indicated its close relation to Jonah's gourd itself. But fertilization was slow. No little gourds appeared, and the season was well advanced when one small melon at last developed and began to expand. It soon became apparent that Jack Frost would not allow this little gourd to mature so as to produce well-developed seed, and the author, unwilling to be outdone by Nature, took hotbed sashes and built a glass house over the gourd vine, so that by prolongation of the season the seed might be sufficiently protected to mature and grow another crop. This effort was successful. From this gourd hundreds of others have been produced. This year the author had fifteen. A history of this remarkable find was written for the Western Farmers' Almanac, and so curious were the public in regard to the study of its gourdship that a number of persons have applied for seed, so that they may see for themselves the manner of gourd that was grown around Salts Cave probably a thousand years ago. An illustration of the original gourd brought from Salts Cave in 1894 will be found on page 319.

The conditions in this cave indicate that it was used by these prehistoric people through a long period of time, but it is improbable that the abode was continuous. It would rather appear that it was held as a place of refuge. If the cave is in the same geological condition now as when

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inhabited, the water supply must have presented great difficulty. It is not reasonable to believe that so large a number of persons would leave the pure air and sunshine and take up a continuous life in the absolute darkness of this tremendous cavern, where only their fires and greased cane reeds could be relied on for light.

Thousands of stones have fallen from the ceilings. These fallen stones in places obstruct the passages, and the main avenue was at one time completely blocked and can only be passed now by a long detour through a side avenue. On these are found ashes, charcoal, and other evidences of fires. When this top layer has been removed, under it is now discoverable another set of fallen stones, and on these had fires likewise been built, and there yet exist ashes and charcoal, the remains of fires which antedated the last dropping from the roof of the chamber. It is reasonable, therefore, to conclude that the time covered by these two falling rocks must have embraced a period reaching over many years.

The remains in the cave indicate that its inhabitants were largely vegetarians, and that they subsisted on agricultural products. Except at the mouth of the cave there are no evidences that these cave people used animal food. At this single point the ash-beds contain large bones, which have been split for some purpose, probably for the marrow, rendering it certain that flesh of some kind was eaten. Many bird bones make it almost sure that they fed in part upon that kind of food. These people resided only a mile from Green River, which is yet considered the best fishing stream in Kentucky. This would make a fish supply certain and continuous. The presence of mussel shells would also indicate that they were not ignorant of the use of this bivalve for food.

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